

FRONT DRIVE

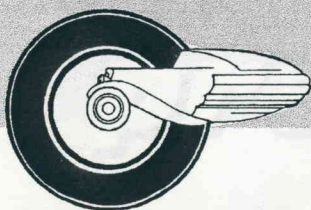
FRONT DRIVE — AUSTRALIA'S NATIONAL CITROËN MAGAZINE

FEBRUARY/
MARCH 1999
VOL 22, ISSUE 6

富康 988



Reg No: A206 78X



from the desk

1998/9 CCOCA COMMITTEE

PRESIDENT — Peter Fitzgerald
297 Moray Street, South Melbourne,
Victoria, 3205.
Phone [03] 9696 0866 [BH & AH]
e-mail: peter@tothepoint.com.au

SECRETARY — Sue Bryant
59 Albion Road, Ashburton,
Victoria, 3147.
Phone [03] 9885 3179
e-mail bryants@a1.com.au

TREASURER — Ted Cross
173 Power Street, Hawthorn,
Victoria, 3122. 0408 423 735
Phone [03] 9819 2208.

SPARE PARTS OFFICER — Mel Carey
10 Omeo Highway, Lucknow,
PO Box 469, Bairnsdale,
Victoria, 3875.
Phone [03] 5152 1040
Mobile 0412 526 126
Fax [03] 5152 2615
e-mail: citroencarey@net-tech.com.au

ACTIVITIES OFFICER — Vacant

PUBLIC OFFICER — John Couche
31 Broadway, Belgrave, Victoria, 3160.
Phone [03] 9754 3583.

EDITOR — Leigh Miles
16 Harrow Street, Blackburn South,
Victoria, 3130.
Phone [03] 9888 7506 [AH]
[03] 9794 3351 [BH].
e-mail: leigh.miles@cussons.com.au
Business_Direct@msn.com.au

CLUB SHOP — Leigh Miles
See 'Editor' for details

LIBRARIAN — Robin Smith
9 St Aubins Avenue, North Caulfield,
Victoria, 3161.
Phone [03] 9527 5429.

ADVERTISING — Peter Fitzgerald
See 'President' for details.

STATE ACTIVITY CO-ORDINATORS
VICTORIA: PETER FITZGERALD
[03] 9696 0866 [BH & AH]

ACT: MIKE NEIL
[02] 6241 4556.

NSW: ALAIN ANTONIOUS
[02] 9958 6240.

WA: STUART PEKIN
[08] 9386 9283.

Welcome to the last edition of 'Front Drive' for Volume 22. Hopefully, I have given you in this edition a range of articles that you will find interesting.

First we have a bit of history in the form of some work that was undertaken in the United Kingdom in the 1950s, using D-series Citroëns, in the development of 'drive by wire' technology.

Next, through the internet I have made contact with Dongfeng Citroën, and partly owned subsidiary of Citroën, in China. This relatively new partnership has borne fruit in the form of both ZX hatches but also a unique vehicle, the 988. This, whilst based on the ZX, carries a four-door, conventional body and is featured on the cover of this issue.

There is also first news of Raid 2000 — your opportunity to participate in an international Citroën event here in Australia. I recommend it for your consideration.

Naturally, all the usual things are here as well — A-tractions [I sometimes wonder whether anybody reads them, but I keep publishing them], the latest for Citroën in 'Marques Meanderings' and Mel Carey's 'Talking Technical', of course.

Leigh F Miles
Editor

NEWS FROM the net

citroen.mb.ca/retromobile99

In addition to supplying an article for this edition, Graham Barton has also emailed me with the following 'net information. John Lipscomb was fortunate enough to be at Retromobile '99. Photos from his visit have been posted by Blair Anderson on his Citroën site. So, for those of you with 'net access, it's well worth a visit.

www.icccr.org

Also worth visiting is the site that has been established for the 12th ICCCR. For the first time ever the ICCCR is to be held in the United States and naturally they are highly enthusiastic about that. The site provides a huge amount of information for anyone who is thinking of going — including advice

on taking a car with you, with the idea of selling it in the US. I suppose, that is not a lot of use for us, as they of course, have their steering wheels on the wrong side of the car. I know, it is the same side as French have theirs...but the French have them on the correct side, while the 'septic tanks' have them on the wrong side.

Leigh Miles



prez sez

Well year we are at the end of another Club year. A year where we have seen the Club continue to grow in many ways.

Mel Carey is doing a fantastic job in the area of spare parts. In my opinion, his overall contribution has been one of the more important contributions by a member to this Club in my memory [and I am a foundation member]. Thank you very much Mel and Colleen for making a real effort for the Club which has seen a great deal more cars hitting the roads in better condition or at all in fact.

Leigh has done a great job on the Magazine again and his efforts are a very visible sign of the Club's healthy condition.

Sue Bryant has done a sterling job again keeping our lists and membership information up to date.

Ted Cross has done a faultless job as

Treasurer again. With the support of this small band we leave the Club at the end of the year with increased membership, a financially sound basis, and a spare parts scheme second to none in Australia. The Club is in a very strong position.

But I must refer to the letter I sent to all members urging them to take a role in our Club no matter how small. If the general members do not support this successful Club, even in a small way, it will wither and die. I mentioned that a number of the committee are not considering standing at the AGM unless support is forthcoming. Please consider what you have got from your Club and what you can put back.

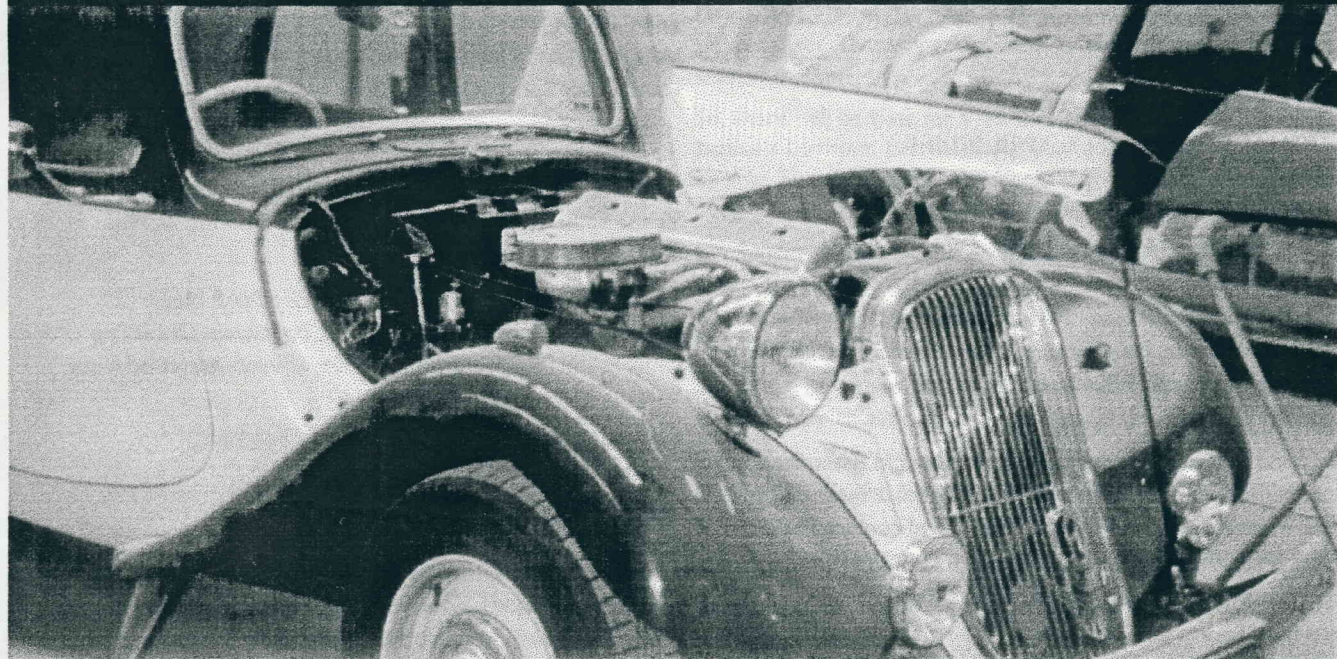
I still have one term to go before I can no longer be President under the constitution. But because of a number of factors I feel I cannot run for re-election. They are: the time I must put in every

weekend I can into by Daylesford property, keeping my Melbourne property on an even keel, managing three businesses with the purchase of a fourth in the near future. I find that I am struggling to put quality time into the Club on an ongoing, consistent basis. But what I intend to do is help or organise projects or events throughout the year. Something that every single member should seriously consider, even if it is only one event, even if it is in your own garage — not a big ask really!

I have enjoyed the 13 years on the Committee of this Club but I feel I would be a fool to attempt another year under my current circumstances. I look forward to enjoying the many and varied events and activities our Club does as a general member.

Peter Fitzgerald

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a-tractions

MARCH 1999

SUNDAY, MARCH 14 — BRITISH AND EUROPEAN MOTORING SHOW

Flemington Racecourse, Melbourne. CCOCA will be in attendance at this great AOMC-sponsored event. So join the Club and see what trash the Brits have produced over the years. Broaden your horizons, and weep for the Poms! Entrance fee: \$5, gates open 10:00am. Some members will be meeting at 156 Eastwood St., Kensington to arrive together. So, either join us there and look out for the CCOCA banner when you arrive.

SUNDAY, MARCH 14 — 5TH NATIONAL CONCOURS D'ELEGANCE AND CONCOURS ITALIANA

Note the new location: The Mansion, Werribee Park. Members are discouraged from attending this commercial event. Support CCOCA and AOMC at the British and European Motoring Show.

SATURDAY, MARCH 20 — ALL MAKES SWAP MEET
Melbourne Markets, Footscray Rd., Footscray. Displaying Club: Holdens of all Ages. Buyers admitted from 9:00am, entry fee \$4.

SATURDAY & SUNDAY, MARCH 20 & 21.
Autumn Petanque Festival at Blue Pyrenees Estate, Avoca.

WEDNESDAY, MARCH 24 — ANNUAL GENERAL MEETING
Canterbury Sports Ground, 8pm.

APRIL 1999

NATIONAL EASTER RALLY, APRIL 2 TO 5.

Have you booked for the 1999 National Citroën Event in Shepparton, Vic. Hosted by Citroën Car Club of Victoria? Booking an information details are on the next page.

SATURDAY, APRIL 17 — ALL MAKES SWAP MEET
Melbourne Markets, Footscray Rd., Footscray. Displaying Club: Austin, Rover, Peugeot, British and European Day. Buyers admitted from 9:00am, entry fee \$4.

GREAT ALPINE RALLY, APRIL 25 & 26

The Alpine Way is now bitumen all the way and Peter Sandow in conjunction with the Peninsula Ski Club has arranged a budget weekend away. Details on page 7 and contact Peter Sandow for complete details and confirm your presence!

WEDNESDAY, APRIL 28 — MONTHLY MEETING
Canterbury Sports Ground, 8pm

MAY 1999

SATURDAY, MAY 15 — ALL MAKES SWAP MEET
Melbourne Markets, Footscray Rd., Footscray. Displaying Club: Vintage and Veteran Spectacular. Buyers admitted from 9:00am, entry fee \$4.

WEDNESDAY, MAY 26 — MONTHLY MEETING
Canterbury Sports Ground, 8pm

JUNE 1999

CCOCA OZTRACTION RALLY, JUNE 11 TO 14.

Join CCOCA for our premier event of 1999 — OzTraction at Eildon on the Goulburn River and Lake Eildon. Once again the organisers have worked hard on your behalf to a weekend away that will not only cater to your every need but satisfy your desire to discuss the marque in all its details. Good food, good wine, good talk with good friends — all at a great price. Whilst booking forms have already been sent all members, here's another chance to make sure you do not miss this fantastic event. Remember, as always spaces are limited, so be sure to book early.

SATURDAY, JUNE 19 — ALL MAKES SWAP MEET
Melbourne Markets, Footscray Rd., Footscray. Displaying Club: Muscle Car and Modified. Buyers admitted from 9:00am, entry fee \$4.

WEDNESDAY, JUNE 23 — MONTHLY MEETING
Canterbury Sports Ground, 8pm

JULY 1999

SATURDAY, JULY 17 — BASTILLE NIGHT DINNER
Venue to be determined, but as always the food will be wonderful, so keep this date free.

SATURDAY, JULY 17 — ALL MAKES SWAP MEET
Melbourne Markets, Footscray Rd., Footscray. Displaying Club: Combined Chrysler Club Day. Buyers admitted from 9:00am, entry fee \$4.

WEDNESDAY, JULY 28 — MONTHLY MEETING
Canterbury Sports Ground, 8pm

AUGUST 1999

SATURDAY, AUGUST 21 — ALL MAKES SWAP MEET
Melbourne Markets, Footscray Rd., Footscray. Displaying Club: Classic and Historic Auto Club. Buyers admitted from 9:00am, entry fee \$4.

WEDNESDAY, AUGUST 25 — MONTHLY MEETING
Canterbury Sports Ground, 8pm





12 • ICCCR • USA

Sept 10, 1998
Boston, MA
Press Release

For Immediate Distribution

Boston, Massachusetts, USA has been selected to be the site of the 12th International Citroën Car Club Rendezvous in August of 2002.

In the pioneering spirit of André Citroën, whose cars were the first to cross the Sahara Desert, explore the impenetrable tracks of darkest Africa and travel the ancient silk route to China, the Amicale Citroën has decided to bring Citroën cars back to North America!

Citroën cars from Europe will travel by a roll on/roll off cargo ship from European ports to the port of Boston. The cars will benefit from a group discount on the shipping. Early projections are that the cost would average \$450 each way and possible lower depending upon the quantity of cars.

US importation laws allow the import of any car 25 years old or older, so there would be no restriction on the importation of these classic Citroën cars.

Charter Airline flights will be arranged to bring Rendezvous participants to the USA.

North American participants will have their first chance to drive to an ICCCR, since all of the previous meets have been held in Europe. A raid of North American Citroën owners will be run from the West Coast to the ICCCR.

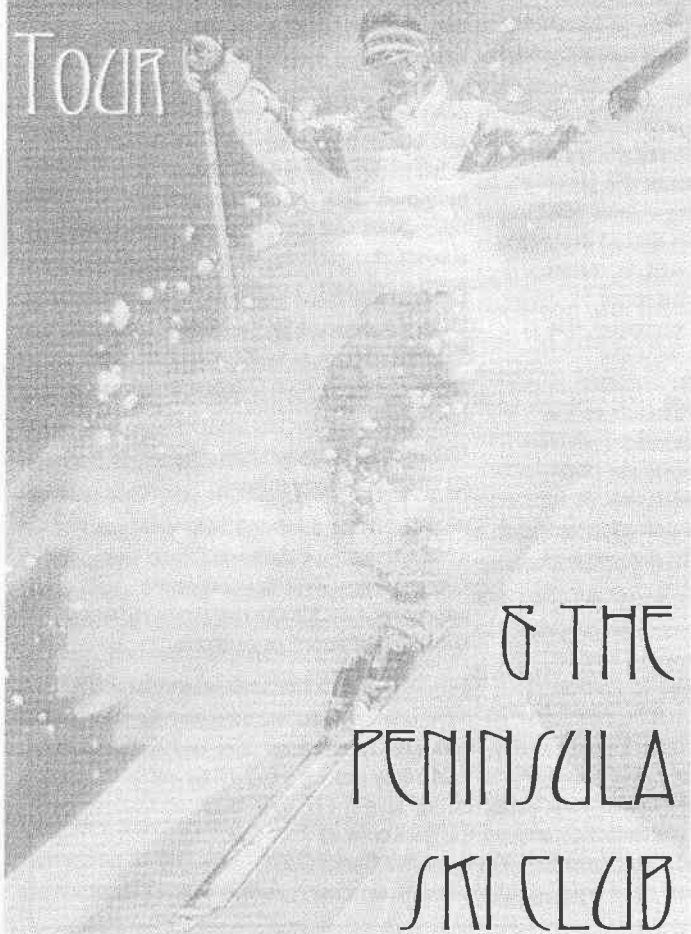
The event will commence with a traditional ICCCR on August 9-11. A Raid to Montréal, duration of one to one and a half weeks, will follow and will include a Rendezvous with the Antique Cars Clubs of Québec.

Cars will return to Boston for return shipping to Europe.

A complete information package will follow.

Michael Cox
12th ICCCR Organisational Committee

1999 GREAT ALPINE ROAD TOUR



& THE PENINSULA SKI CLUB

We will get under way at 8:00am 'on Saturday 24 April from the Fountain Gate Civic Centre, Magid Drive, Melway 110, C4, heading for Bairnsdale. There we will break for morning coffee with Mel and Colleen at about 11:00am.

At 11:30 we head for Omeo on the Great Alpine Road, through Bruthen, Tambo Crossing, Ensay nad Swifts Creek. We will be into Omeo in time for lunch at the Golden Age Hotel. There, the brave can try the Emu Steaks, of for the less adventurous there is always lambs fry or other more usual pub fare.

At 3:00pm we depart for Mt Hotham, continuing along the Great Alpine Road through Cobungra, Horse Hair Plain and Dinner Plain. That will get us into the Peninsula Ski Club by around 4:30pm.

So, there will be time for a wander to watch the sunset from Lennie's Lookout, before your sumptuous dinner — prepared by you! The ski club has excellent cooking facilities, so plan to cook and eat as a group and make the most of the facilities.

On Sunday the morning is yours to explore the area. Sun rise across the Dargo High Plains is usually spectacular. Walk to Mt Hotham, or just wander through the village. Drive over to Dinner Plain...whatever.

Lunch can be either back at the Peninsula or perhaps you would prefer to eat out.

Depart around 23:00pm for the trip back to Melbourne, via Harrietville, Bright, Myrtleford, Milawa and the Ovens Valley Highway.

What to Bring: Food, bedding, refreshments...the usual stuff.

Accommodation will be \$20 per person — so make the most of a cheap break!

Talk to Peter Sandow to confirm your attendance —

**THIS IS A MUST —
ON [03] 9822 4473.**



BOOKS

in review

Citroën are probably perceived as the most French of the French automobile manufacturers - no French film would be complete without a nude love scene or a Traction, 2 CV or DS [depending on the film's vintage]. And yet this most French of automobile manufacturers was also one of the first foreign concerns to set up a factory in the United Kingdom. Furthermore the British factory was André Citroën's first foreign enterprise. Of course Britain once had an indigenous motor industry even if the main players were US owned - Ford and General Motors. Britain now has only two domestically owned manufacturers - Morgan and Reliant. Most Americans will probably be familiar with the former but the latter is likely to be unknown to all except fans of the BBC comedy program "Only Fools and Horses". For those unfamiliar with this program, Reliant build a plastic bodied three wheeler. But all of this has nothing to do with Citroën apart from the fact that Citron used to build a plastic bodied four wheeler - the Bijou..

André Citroën saw the UK market as being ripe for exploitation within a year of setting up his business in Paris and initially his products were sold in Britain via a concessionaire. However, British tax policy levied both import duty and Purchase Tax at a rate of 40% on all imported automobiles. André Citroën quickly realised that the only way to compete with domestic products was to build cars in the UK and to incorporate within those cars as much British content as possible. A further advantage to building cars in Britain was that this enabled Citroën to gain access to the British Empire markets [India, South Africa, Rhodesia, Australia and New

Zealand]. Britain's biggest automobile factory was built in Slough to the west of London and British variants of the product were built there from 1925 to 1965. Post 1965 has seen an end to manufacturing and the company now confines itself to marketing, advertising and logistical support to the dealer network.

Much of this story is of course well known - anglicised versions of the DS and Traction are much sought after by those in the know and Citroën's rarest production model, the 2CV based Bijou holds a unique place in the Citroën pantheon as the only Citroën to have been both designed and built solely outside France.

The story of Citroën's Slough operations has been shrouded in secrecy. Requests to Slough for information about the past have either been met with a point blank refusal or with statements that all archived material had been destroyed. In recent years Slough has been even more secretive than its parent company, due in part to the desire to reinvent the company. Citroëns had a reputation in the United Kingdom for quirkiness - to the extent that one could not read a review of a Citroën automobile that did not contain the "Q" word and it was undoubtedly felt that the company had to distance itself from its past if it were to compete successfully.

It therefore comes as a welcome surprise to discover that the renowned author John Reynolds has managed to unlock



doors that were hitherto firmly barred, to talk to people whose lips had formerly remained firmly sealed and to obtain original photos and other documents that had apparently been destroyed.

John Reynolds' name will of course be familiar to the anglophone Citroën enthusiast - he is the author of "The Restorer's Guide to the Citroën DS" and "Sixty Years Of The 2 CV", the two definitive English language works on these two cars. "A to X" is, as one would expect, full of elegant prose and replete with hitherto unpublished photographs, both archive and new including a large number of colour prints. Furthermore, it is full of previously little known or unknown facts about Citroën's UK operations and for the newcomer to the subject also includes an overview of the parent company's operations.

With a foreword by the redoubtable LJK Setright, "From A to X" is an essential addition to any true Citroën enthusiast's bookshelf.

"From A to X" is published by CITROExpert in Holland.

People buying the book before August 1999 can enter a competition to win a Citroën Bijou, worth in Europe approximately \$3000 and probably worth substantially more in Australia.

© Julian Marsh 1999

HOW TO ORDER

Order this book direct from David Conway in the UK, using your Visa or Mastercard.

The price is just £29.95 plus p+p of ~£4.36 by sea or ~£12.16 by air.

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email at ConwayCV2@aol.com or

'snail mail to 152 Barkham Rd., Wokingham, Berks, RG41 2RP, UK.

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A WORD FROM Paris

Just write it down, if you will, to my ungovernable enthusiasm for antique stoicism, but I would be less than frank if I pretended that there was not a tear in my eye whenever I contemplate the noble forbearance of Parisian rats. Their philosophic calm in the face of every provocation irresistibly reminds one of Marcus Aurelius and there can be little doubt that a lesser breed of animal would long since have gone whining to the United Nations to protect its interests.

It's curious, when you come to think of it, that the French who make such a business out of their tolerance for minority groups should have this hysterical objection to rats. In a few weeks' time, the annual anti-rat spring offensive gets under way and you would not believe all the nasty little tricks the authorities propose to get up to: tons of rat poison to be dumped all over the place, fines to be levied against citizens who fail to keep lids on their dustbins, round-the-clock anti-rat commandos on duty, and so on.

You can get some idea of the immoderate lengths to which Parisians go in their hostility to rats from the way the newspapers have been carrying on about the experience of a resident in one of the city's more ancient districts. What happened, quite simply, was that he came home and found that rats had worked their way through from some forgotten catacombs beneath the building and that fifteen of the little chaps were frisking about his apartment. To read the headlines devoted to this incident you would think he had found taipans in his kitchen instead of just a little group of rats who probably, if the truth were known, only wanted to play anyway.

Why this unreasoning hostility?

According to the latest estimate, there are six million rats in Paris-more than

ten times as many as there were in the Middle Ages, although what mediaeval technocrat made the latter count has not been revealed-almost one rat for every Parisian in fact. Yet while there is not the slightest difficulty in seeing Parisians-as long as you keep away from the tourist districts-whole days sometimes go by without one catching so much as a glimpse of a rat.

What more could be asked for in the way of discreet self-effacement? Commenting on the experience of the gentleman who found the fifteen rats cavorting in his bedroom, one newspaper sought to chill our blood with the announcement that if all the rats in Paris were to come together on the Place de la Concorde they would cover the whole of that imposing space to a depth of two feet. Yet what do we find? Parisians in their cars actually do cover Concorde and to a depth of well over two feet whereas I cannot offhand recall ever having seen even one rat there, let alone a rat in a car.

Similarly, dark tales are whispered in the cafés of super-rats, megalithic rodents the size of St Bernards, just waiting for the signal to take over the city. Yet the biggest specimen in the laboratory of the anti-epidemic service is a weedy little brute weighing only a trifle over one pound.



Then there are all the legends about the appalling voracity of the creatures, with Parisian gourmets telling each other aghast over the coq au vin and the rognons de veau a la lyonnaise that Parisian rats consume no less than 180 tons of food per day. One hundred and eighty tons for six million-pretty thin pickings, I would have thought. One doubts that the same number of Parisians would think it such a lot if it were all they had to eat.

But it's quite pointless, of course, trying to eradicate sheer blind prejudice by any appeal to reason. Even if you conclusively proved that rats had built Notre Dame, invented Camembert cheese and stormed the Bastille, I fancy the French would not like them any better.

Alister Kershaw



LOOK

No Hands

Back in the Fifties, even on busy roads traffic was so light that just half a dozen cars at a standstill were enough to constitute a major snarl-up. Thirty years ago there were around 8.5 million vehicles on the United Kingdom's roads and fewer than 15% of British households owned one. Today, 70% have at least one vehicle and almost 20% have two or more., consequently the number has grown to some 23 million, with an extra 500,000 arriving every year.

In traffic flow terms, this growth rate is alarming. Already there are 65 vehicles for every kilometre of road, whilst on motorways and dual carriageways there are 2,731 vehicles per kilometre — 7.7 metres of lane space each. Moreover, motorway traffic volumes are increasing by an average of 9.5% each year, so that sections of the M6 and M25, designed to carry up to 79,000 vehicles per day, now regularly have to cope with flows in excess of 130,000 vehicles a day.

To prevent the whole of Europe slowly becoming covered in black-top to meet the car's needs, the European Economic Community in 1991 launched the pan-European Prometheus road traffic research initiative, designed to explore new ways of optimising road usage through automated vehicle control and computerised traffic management systems. Prometheus, an acronym for Programme for European Traffic with Highest Efficiency and Unprecedented Safety, is a co-operative venture between manufacturers and Government research agencies, including the Department of Transport Road Research Laboratory at Crowthorne in Berkshire.

British scientists have been down this particular technical road before. As early as 1960 the TRRL had anticipated the problems of motorway congestion, even though the first 67-mile section of the M1 had been opened only the year before. Designed to cope with an average daily flow of 14,000 vehicles, this stretch

between Watford and Crick now carries 100,000-130,000 vehicles a day.

Begun in the late Fifties, the TRRL's automatic vehicle guidance research project foresaw that, inevitably, all normal roadgoing vehicles would have to be equipped with 'auto drivers' for use on motorways and trunk roads. Such devices would overcome the physical and psychological limitations of human drivers and so permit travel speeds and traffic densities far greater than rival transport systems such as railways and at a lower capital cost.

The systems would monitor the position and progress of individual vehicles on a road and control their steering, headway and cruising speeds from a central computer. The Laboratory's brief was to

On the TRRL track it was possible to drive for hours on end reading a book in this modified Citroën DS which steered itself.





solve the practical engineering problems involved. Work started in earnest with the opening of the Laboratory's new Crowthorne test track in 1960. At that time both General Motors and RCA in America were investigating automatic car steering systems, using guidance provided by a cable buried in the road, so two separate signal cable systems were installed under the Crowthorne track for the control of steering and distance keeping.

Lateral control, for steering, was achieved via a continuous cable, buried approximately 70mm beneath the surface in the centre of each lane, carrying a 50mA 5kHz signal. The magnetic fields produced by this cable were sensed by two coils mounted about 1.5 metres apart on the front bumpers of the test cars, all

standard production models of the time. The difference between the output voltages of the coils gave an indication of the sideways movement. The ideal front wheel angle to correct the car's course could be compared with a reading of the actual front wheel angle, as revealed by a potentiometer attached to the steering column. The necessary steering correction could be signalled to the driver via a hands-off steering mechanism. In this way test cars could be driven at speed safely irrespective of visibility; with fog and smog a notorious traffic hazard at the time, this was considered to be a high priority for future production cars.

Longitudinal control, for speed and headway, was effected by a chain of cable loops buried along the track, each connected to a monitor which detected the vehicle's presence. The idea was that, by passing this information to a central processor, a human controller would obtain sufficient data on the number of vehicles passing, and their relative speeds

and distances, to keep track of traffic conditions along the road. The same system could then be used to transmit signals back to passing vehicles to actuate their brakes, accelerators or cruise control devices. Thus the controller would be able to regulate the flow of traffic and the spacing between vehicles so precisely that they could follow one another closely at speed with absolute safety. Eventually it was hoped that 'road trains' of fast-moving vehicles could be run along motorways; starting, stopping and steering entirely by remote control.

Although the first of these goals was well within the limits of the know-how of the time, the second proved far too ambitious for the computing technology of the Sixties. Then sophisticated digital electronics and 'control-by-wire' techniques were only a practical proposition given the huge budgets of defence or aerospace applications. So, as an alternative, experiments were carried out with miniature in-car radar sets. Fitted

The Citroën DS19's driver demonstrating 'hands off' motoring at Crowthorne in the Sixties. The car required no steering input from the driver.



LOOK

No Hands



like an invisible headlight to transmit a pencil beam ahead, it would sound a horn when the car in front became too close for safety. But here again, image resolution problems in the cluttered, crowded road traffic environment were insurmountable. what's more, it was found that the delicate circuitry involved simply could not withstand prolonged exposure to the heat, dirt and vibration found under a car bonnet.

The first test car used at Crowthorne was a Standard Vanguard estate, a model used by Government and the Forces at the time. The driver steered manually, following instructions received from a 'barber's pole' indicator mounted on top of the fascia. This variation of the type of aircraft blind-landing display system rotated to show the amount and direction of steering wheel movement needed to keep the vehicle correctly positioned on the road. The Vanguard was also equipped to receive speech signals from the

guidance cable in a 'talking roadsign' system known as RITA (Road Information Transmitted Aurally). In principle this was very much like the system now being earliest developed in the Prometheus programme.

The next test vehicle, a Citroën DS19 built at Slough in 1960 and now preserved in the Science Museum Road Transport Collection at Wroughton, was very much more sophisticated and perhaps the first true automotive 'drive-by-wire' design. The Citroën's high-pressure hydraulics were modified to provide fully automatic actuation of its steering mechanism. To prevent inertia and backlash in this automatic mode, the steering wheel was declutched from the rack and remained disconcertingly motionless. At other times the car could be steered normally but in a true 'drive-by-wire' method, which used an electronic analogue of the steering wheel position to operate the hydraulic valves in the steering rack instead of the

usual mechanical linkages. Using this facility, the Laboratory's scientists were able to play tricks with the car's steering response and give the Citroën pronounced understeer or oversteer characteristics at will. This was particularly useful when conducting driver-skill studies, to find out how drivers responded to varying conditions.

Later, the Crowthorne technicians experimented with joystick steering on this car, in exactly the way the Citroën's designers had originally proposed. However, it was soon realised that to perfect this 'drive-by-wire' steering system the DS's power steering needed to incorporate some form of artificial 'feel' or feedback, related to the car's speed, for the driver. Coincidentally Citroën's own research was leading in the same direction

Sensors fitted to the front of the Citroën DS19 picked up guidance signals from cable loops buried under the track surface.



and its Vari-Power steering was introduced on the SM in 1970 and later used on the CX.

In its auto-guidance mode the DS was capable of lapping the Crowthorne track at speeds of up to 80mph for hours on end without deviation or loss of control. Even with snow or ice on the road surface the car would hold its course steady, following in its own wheel tracks for mile after mile at speeds up to 60mph while the driver sat back and read a book. In fact in slippery conditions the automatic steering system was far more effective in maintaining vehicle stability than a human driver.

Whilst the Citroën's high-pressure hydraulic system was ideal for research purposes, it was obviously far too complex and expensive for use in budget-priced family cars. So in 1969 two conventional British-made saloons with automatic transmissions — a Mini and a Ford Cortina — were obtained. The problem now was to achieve very high component reliability at low unit-manufacturing and installation costs, so that the system could be mass-produced for use in family cars. An average of a million hours of trouble-free operation was judged to be the minimum acceptable safety level in automatic vehicle guidance equipment specifications.

Both vehicles were converted for fully automatic control but this time instead of hydraulic power, the steering effort was provided by an electric motor geared to the steering column; engine manifold depression was the power source for brake and throttle actuation. Both cars were fitted with closed-loop speed control systems; in effect cruise controls activated by signals picked up from cable loops buried under the track. On various TRRL Open Days in 1971, the Cortina

was demonstrated under automatic control with no driver at the wheel and only the rear seats occupied by passengers.

By this time it was becoming clear that, although technically feasible, highway automation on normal roads was a long way off. At a time of economic recession, huge capital the costs involved were simply unaffordable. Faced with a severe reduction in Government funding for long-term projects, the TRRL concentrated on developing two promising short-term commercial applications.

The first idea was a dual-mode bus which could be operated by a normal driver on ordinary routes or under fully-automatic driverless conditions on special lanes or tracks equipped with guidance cabling. A Daimler Roadliner 50 bus was acquired and converted to full 'drive-by-wire' control using a joystick. Switching between modes was just a matter of pressing a button. In the automatic mode, the bus could follow a pre-programmed route or timetable, stopping in the right places and starting again entirely without human supervision.

Any obstacles in the bus's path were detected by an infra-red sensor and the brakes applied. Initial interest from public transport operators waned when the impact on staffing levels was realised.

The TRRL's second concept involved the adaptation of standard saloons for use by severely-disabled drivers using the same joystick control technique. During 1973 and 1974 the Mini was used with the joystick positioned for foot operation by people with severe arm or hand disabilities. Tests were carried out with both able-bodied and severely-disabled drivers with encouraging results. A newly-

acquired Ford Transit minibus was used for a more ambitious development allowing right places and starting again the driver to remain in his electric entirely without human supervision. wheelchair, which was plugged into the vehicle's electrics so that the batteries could be recharged *en route*.

In the late Sixties the TRRL carried out a simple cost/benefit analysis of the likely effects of large-scale road vehicle automation on the entire British motorway and trunk road network. Assuming that both the average speed and the volume of traffic remained constant, its study predicted that a switch to automation could prevent about 40% of road accidents and increase the traffic handling capacity of the network by at least 50%. On this basis, it reckoned that the capital costs of laying cabling and adapting vehicles would be repaid by the end of the century. This study took place before the Energy Crisis in the Seventies, so the further and even more important benefit of fuel savings was not included in the calculations. With the benefit of hindsight, the claims look very conservative. Thirty years on, not only has the number of vehicles on UK roads almost doubled but the average mileage travelled has increased by almost 50%.

Doubtless in recognition of its pioneering research all those years ago, the TRRL has been awarded a number of automated vehicle research projects in connection with the EEC Prometheus programme.

Consequently, some of the older hands among the Lab's staff found themselves working in very familiar territory — not so much 'state of the art' as a trip down memory lane!

Thoroughbred and Classic Cars — March, 1992



JOINT Venture



In 1992 Citroën entered into a joint venture agreement with Dongfeng Motors in China to form the Dongfeng Citroën Automobile Co Ltd. Dongfeng holds a 70% share in the business, Citroën has a further $\frac{1}{4}$ and the balance is held by Société Generale and Banque Nationale de Paris. The DCAC business is one of the largest joint Sino-French ventures, with a total investment in excess of US\$1.2 billion. The joint venture was established to build models for the Chinese market based around the Citroën ZX Reflex, although offering a range of models suitable to the Chinese market. The target is for DCAC to produce 300,000 cars per year along with an



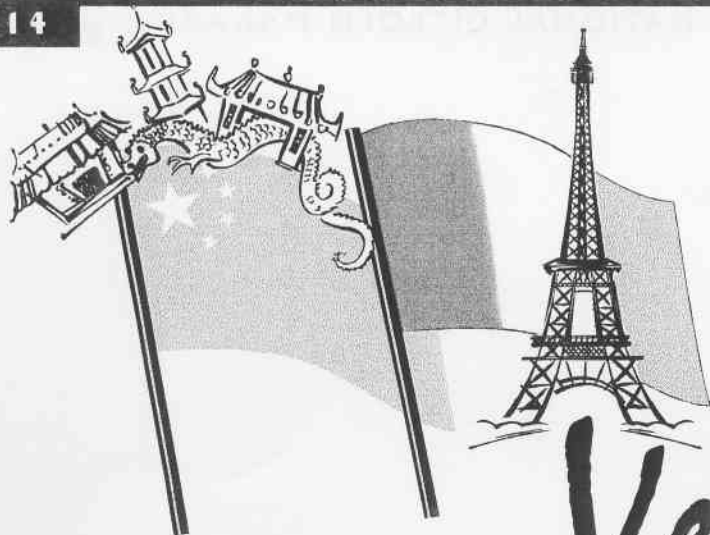
additional 400,000 engines. Currently production runs at around half that target. Two manufacturing facilities are the result. The first, in the WuHan economic and technology development zone has as its primary function stamping, welding, painting and vehicle assembly. It covers an

area of almost 1.3 million square metres. The second site is in the Xiangfan industrial development zone and produces engines, transmissions and axles.

Today the Fukang is available in a range of trim levels and engine capacities. The trim levels range from RG through RL to RP. Above that are AL and EL. Engines are Citroën-







JOL Venture

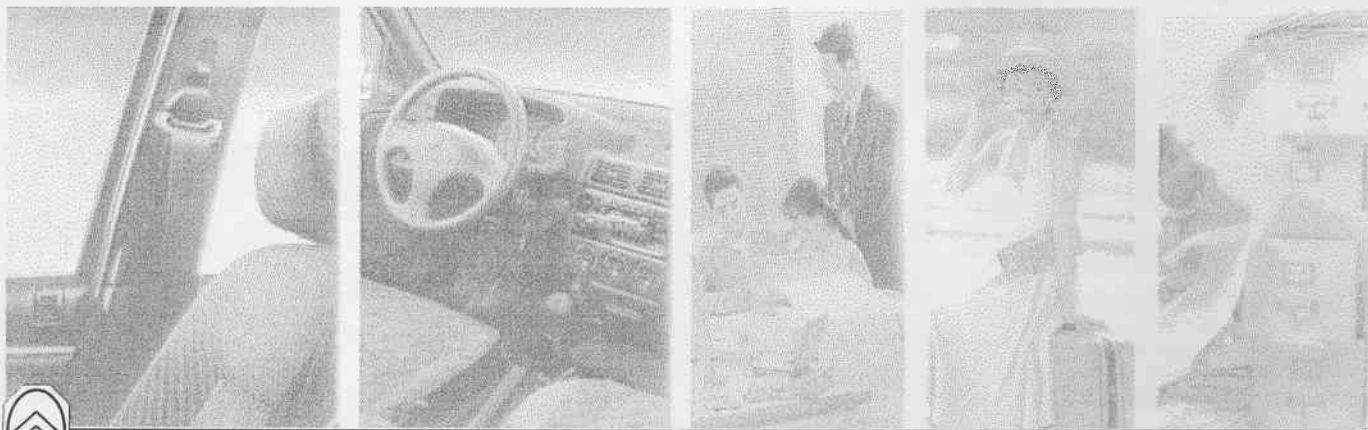


derived 1.4litre, in both injected and carburettor form and a 1.6litre injected motor. The carburettor motor is available only in base trim, while the 1.4litre injected is available in RL and RP. The 1.6litre is teamed with the top levels of trim only. All models are very highly specified, with even the RG version being fitted with air conditioning. Models further up the trim scale boast central locking, electric front

windows, rear spoiler and power steering. All models run a 5-speed manual gearbox as standard. Within six months the new EL-I model will be launched. This will boast an electronically controlled 5-speed automatic gearbox.

The 1.4litre

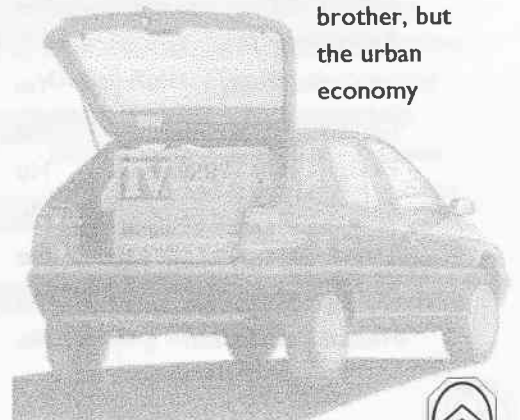
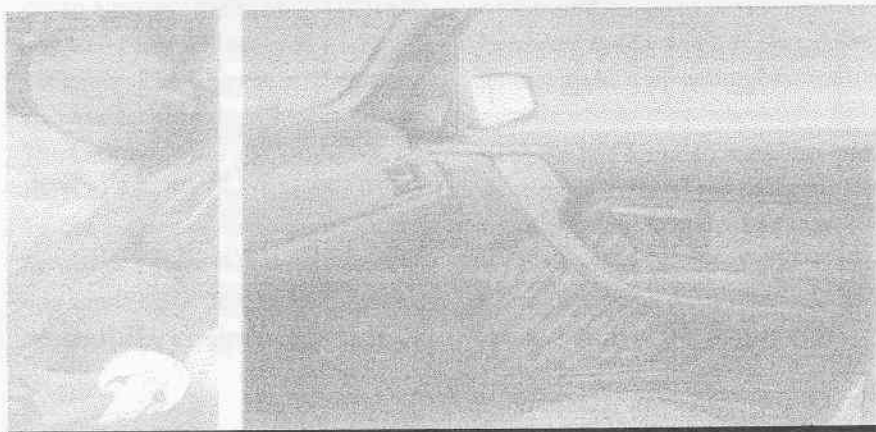
carburettor motor provides a top speed of 160km/hr and reaches 100km/hr in 16.4seconds. Maximum power of 49kw is developed at 5,400rpm. At a constant 90km/hr it uses 6litres of fuel per 100km. In its





injected form the maximum speed increases to 170km/hr and the time to 100km reduces by 0.6seconds. Power is up, running to 55kw, but so the engine speed at which it is developed — 5,600rpm. In European 1.4litre injected ZXs the same maximum power was attained, but at an even higher 5,800rpm. The European motor reached a very similar top speed to the Chinese engine, but attained 100km/hr in a far shorter 11.9seconds. Of course, the European motor was designed to run on Super fuel [95-98 octane] while the Chinese engine drinks 90octane. The fuel economy at 90km/hr is slightly improved over its carburettor

brother, but the urban economy



	Fukang RG	Fukang RP	Fukang RL	Fukang AL	Fukang 988 EL
BODY TYPE	5 door hatchback				4 door sedan
ENGINE					
Number of cylinders	4 in line				
Cubic capacity	1360cc			1580cc	
Bore and stroke [mm]	75 x 77			83 x 73	
Fuel system	Carburettor		Bosch multipoint fuel injection		
Max. power [kw]	49 @5400	55 @ 5600		65 @ 5800	
TRANSMISSION					
Gearbox type	Manual only, at present				
Number of gears	5				
TYRES	165/70 R14.8IT				
WEIGHTS					
Kerb weight	1037	1050		1070	1080
Laden weight	1415	1425		1435	1455
PERFORMANCE					
Maximum speed [km/hr]	160	170		182	
0 to 100km/hr [sec]	16.4	15.8		14.5	
FUEL CONSUMPTION					
90km/hr [L/100km]	6.0	5.9		6.5	
120km/hr [L/100km]	N/a	8.0			
Urban cycle [L/100km]	8.5	8.5		10.0	
Fuel type	90 octane and above				
Fuel tank capacity	51 litres				
DIMENSIONS					
Overall length	4071				4291
Wheelbase	2540				
Track [fr/rr]	1423/1424				1432
Overall width	1702				
Ground clearance	145				
Boot volume					
Rear seat up [litres]	324				437
Rear seat folded [litres]	1146				
EQUIPMENT LEVELS					
AM/FM Stereo Radio/Cassette	Yes	Yes	Yes	Yes	Yes
Air Conditioning	Yes	Yes	Yes	Yes	Yes
Central Locking	No			Yes	Yes
Electric Front Windows	No			Yes	Yes
Rear Spoiler	No			Yes	No
Tinted Glass	No			Yes	Yes
Power Steering	No			Yes	Yes
Heated Rear Screen	No			Yes	Yes





suffers [8.5litres per 100km compared with 10litres per 100km for the injected car]. The range-topping injected 1.6litre motor develops 65kw, also at 5,600rpm, which propels the car to a maximum speed of 182km/hr and taking just 14.5seconds to attain 100km/hr. The Chinese models are also heavier than their French cousins. The kerb weight of the DCAC cars starts at 1,037kg and rises to 1,050kg for the 1.4litre injected model. All the European 1.4litre cars were below the one tonne mark. The range topping injected 1.6litre sedan weighs in at

1,080kg while the 1.6litre French car was 995kg. All the models run on 165mm tyres on a 70profile, as did the French ZX. However, wheel diameter has been increased from 13inches to 14.8inches.

However the Chinese market expects its cars to be conventional booted models, rather than hatchbacks. So, over the last 6 years DCAC has been developing a model especially for the this market. In August 1998 they announced the launch of the Fukang 988. [The model designation is not mere chance — the August 1998

launch date being commemorated in the name.] This model is only available with the 1.6litre injected motor and long list standard features. The 988 is based on the ZX Break chassis and the design is the result of co-operative project between Dongfeng and an Italian designer. Along with its high level of appeal to the local market the three-box model boasts a significant increase in luggage capacity. While the hatchback boot holds 324 litres with the rear seat in place, the new model increases that to 437litres. Whilst Australian regulations make it difficult to arrange the importation of any of the range of DCAC vehicles into Australia, price would certainly not be a limitation. FOB Shanghai the prices start at just US\$8,000 for the 1.4litre whilst a 1.6 injected car would be just US\$10,000. Of course import duty and sales taxes would add another US\$5,000 to the price of the 1.6i, and freight would add about another US\$1,000. That puts it to US\$16,000, which at the current conversion rate is A\$25,800. That assumes that the car meets Australian Design Rules. [The fact the steering wheel is on the left does not help either!] With Xsara 1.8litre manuals with air bag and sundry other goodies being available here for under A\$30,000 I doubt that the economics make sense. Of course, the desirability of owning what in the 'West' is a





unique vehicle always has appeal to some collectors. However, models of the new sedan in both 1:18 and 1:43 scale are available at more reasonable prices. In addition to this range of family cars DCAC supply ZX chassises to DFM who then fit a van body, derived from the C15 van. The C15, of course was based on the Visa hatchback. DCAC are involved in neither the sale nor the after sales servicing of these light vans. The Chinese model is produced on a ZX chassis and is presumably, therefore larger than the C15 — more in line with the dimensions of the new Berlingo, which is being considered for launch in Australia. 1:43 scale models of this vehicle is also available.

Models of the sedan and hatchback cost US\$16 for the 1:43 scale, while the sedan is also in 1:18 scale for US\$45.

The larger model is produced in five colours. Postage from China would be US\$11 for the small models and US\$20 for the larger one. Payment would need to be made by international draft in US dollars.

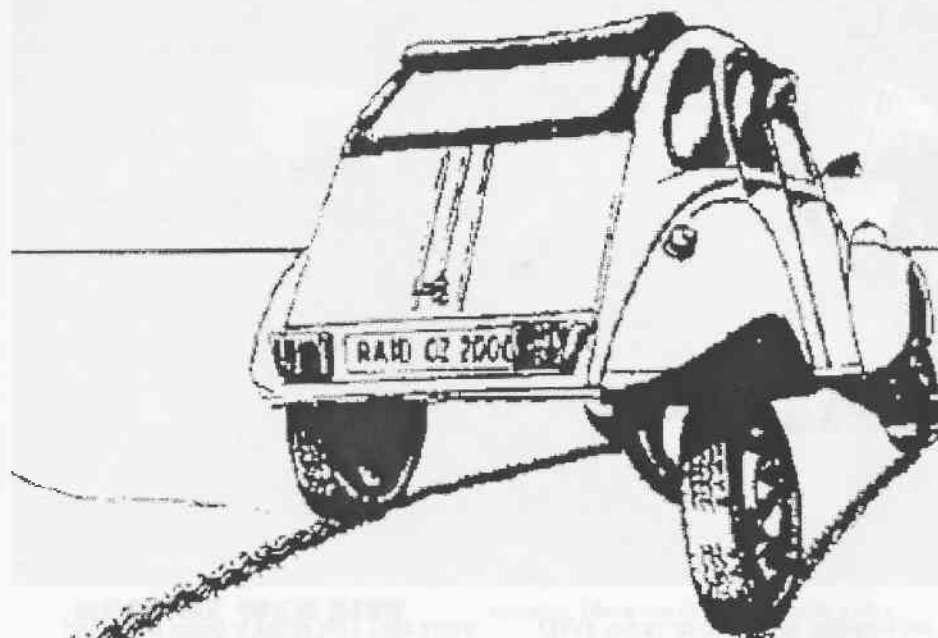
Today most parts for these vehicles are produced by DCAC in China. The engine, gearbox and interior are all locally sourced. Additionally smaller items such as brakes, alternator, air and oil filters are also made in China. The quality level of the Chinese product is such that DCAC is now the primary source of a number of ZX parts for the European market; wings, bonnets and other body panels are their main export offerings. DCAC are very interested in increasing their export sales and have expressed

interest in selling ZX parts directly to Australian Citroënists. Unfortunately, the total lack of any ZX Citroëns prevents such transactions. They certainly believe that the prices ex-China would be significantly below those from Citroën in France.

DFM, who's factory is in southern China assemble both Xantia and XM models for local sales, from CKD kits exported from France. DCAC's involvement in this project is limited to spare parts supply and some after sales servicing. In discussions with Pierre Huang, the manager of the DCAC Spare Parts export division, it was indicated that the prices charged to them for parts, by Citroën are often well below that charged to other affiliates in the region.



RAID



AUSTRALIA

RAID AUSTRALIA #4 IS FOR 2CVs AND A- SERIES CITROËNS

As in previous Raids in Australia this Raid is for 2CV and a series Citroëns. The Raid will be led by a 2CV and each of the groups of Raiders will be led by a 2CV. Other Citroëns are welcome as support vehicles. These Citroën support cars and their crews do such things as

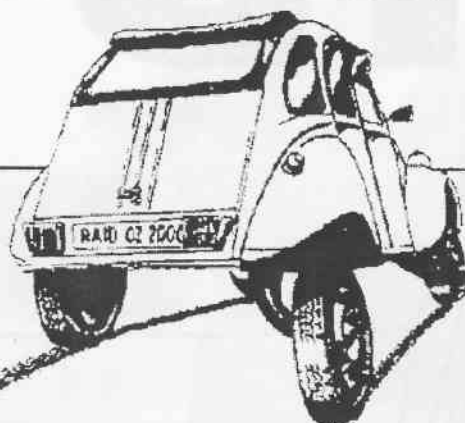
first aid, filming and mechanical support. They also carry stuff that would overload the A Series cars. Let us know in which way you can help make this Raid a success and what type of Citroën you will be driving.

The Raid convoy will be divided into groups with about five or six cars in each group. Each group will be led by a 2CV driven by an experienced Oz Raider with a larger Citroën as backup.

Each group will have a mix of overseas Raiders and Oz Raiders from different states. Our experience is that this works very well as strangers soon become friends and friends from other groups get together each evening and are introduced to more Raiders. The Raid is a basis for international friendship. the 2CVs are the medium which melds the groups with shared memories of an adventure of a lifetime.



RAID



AUSTRALIA

This Raid will have a 4WD vehicle as a tail end Charlie, which will carry welding gear and heavy tools as well as some spare parts. The first aid car will carry a flying doctor radio. All Raid cars must have a CB radio. Your car is to be correctly prepared as advised in the Citroën book ' *Ici commence la aventure*'. We recommend that you talk to an experienced Oz Raider and we advise you that an overloaded car will break down. The maximum total weight of a 2CV with passengers, fuel, 20 litres extra fuel, 20 litres of water, two spare wheels, your camping gear and every thing else you carry, must be less than 930kg. Cut the handle of your tooth brush in half and leave your back seats at home to reduce weight. A 2CV can only carry two people and their gear and be less than 930kg. The Raid up front cost is \$500 per car, which covers organisational costs such as magazines, postage, first

aid supplies, flying doctor radio, 4WD expenses and camp-ground fees.

RAIDERS' ADDRESSES

The list of Raiders addresses is in need of an update. If you know the current address for the following Raiders please notify either Steve or Ralph [editor].

Howard Craddock
Janis and Sarma Priedkains peter Scholz
Alex Lowe.

RAIDERS' RAMBLINGS

Uli Witting and Bernd Weise are in Perth now, [early February] and both are becoming involved in the 75th anniversary of the first car ever to drive around Australia. This car was a Citroën 5CV and was owned and driven by Neville Westwood the father of Ron Westwood who is well known to all Oz Raiders. Ron still owns his late father's car and will be driving it around Australia with many other 5CVers to commemorate "Them Rounders" of 75

years ago. This event is being organised from Perth to be run in November-December 2000, details will soon be published.

Kathryn Dodington is now the proud owner of the Sahara Rene and Marjolijn drove in Raid Oz #3.

Sue Coles of Raid #3 got married in August 1998.

Joe and Helen Schembri bought Michael Mohr's 2CV "Lollipop" after Raid #3.

Andreas and Anke came to Perth in 1998 with their Alaskan registered 2CV in which they toured the-Kimberly and North West before leaving their 2CV with Peter Morgan in Darwin.

YOUR RAID COMMITTEE

Bruce Elsegood	NSW	Raid Leader
David Gries		Vic Technical
Rolf Breyer		SA First Aid
Phil Ward	SA	Graphics
Ralph Hibble		WA Editor
Steve Wedell		Qld Finance





RAID OZ WEB SITE ADDRESS

<http://www.in.com.au/~stevewedell/raid>

RAID OZ EMAIL ADDRESS

Cheersbastard@hotmail.com

RAID AUSTRALIA #4 — AUGUST 12 TO SEPTEMBER 9, 2000

This Raid is to start from Alice Springs, go north then take a route up the Sandover Highway with bush camps along the way and with time to grease the king pins. We will visit the township of Urandangi which was the town featured in the film *Crocodile Dundee*. Next we go to Mount Isa a large inland town based on mining industry. Here we can stop relax and make any needed repairs and adjustments and grease the king pins. Along some very rough tracks and we get to lawn Hill, an oasis surrounded by dust, dirt, rocks and dry

country. Here we can swim, hike, relax, canoe and grease the king pins. We then go via Karrumba dipping our toes in the Gulf of Carpentaria while looking out for crocodiles and grease the king pins. East through outback Queensland dodging the kangaroos and visiting hot springs and ancient lava caves while stopping for a bush camp and to grease the king pins. We reach the East coast at Mossman which has a wet tropical climate, but we are here in the dry season. Now we grease, the king pins again ready for a ten day expedition to Cape York and back. We cross many rivers and creeks [wot no bridges] but yes there are crocodiles. To cross one or two of the rivers will mean a concerted group effort with long ropes and the assistance of a 4WD. There will be a limit to the number of cars allowed to go in the group to Cape York [probably 40 or 50]. An alternative route will take the remainder of the raiders along the coast and into the tablelands visiting a number of National

Parks before we all meet together at Daintree on the tropical coast for a luxury end to the Raid. Here we camp within metres of the beach under swaying palm trees on green lawns with all facilities available. Here we can again grease the king pins before saying a final goodbye and bon voyage.

RAID CAPE LEEUWIN TO CAPE YORK.

For those who would like to start from Perth Western Australia we have arranged to leave Perth on the 5th of August and have a week long Raid to Alice Springs via Cape Leeuwin. This way we Raid from the most south westerly point to the most north easterly point of Australia. This way we travel from coast to coast from temperate rainforest to tropical rainforest with extensive desert areas in the middle. We promise you a trip of a lifetime.



marque's meanderings

EXPLORE EUROPE FROM \$26 A DAY WITH CITROËN

Citroën Australia and European holiday specialists, SpreeCarz, have combined to make it possible to explore Europe in a brand new Citroën Xsara from as little as \$26 a day, an unbeatable price for a spacious, economic and stylish way to see Europe.

'There could be no better way to explore Europe than in a Citroën Xsara,' says Miles Williams, General Manager for Citroën in Australia.

'The Xsara has plenty of space inside for up to five people and, thanks to the notchback shape at the rear, an unusually large boot. With fuel costs up to four times what they are here in Australia, fuel economy is essential, so there is a choice of economical petrol and refined, but miserly, diesels to choose from in European specification Xsaras.

'All the Xsaras included in the programme are fitted with central locking, digital stereo radio cassettes and, as even in Europe it can get hot, many have air conditioning.'

Citroën and SpreeCarz are able to make this remarkable offer thanks to assistance from the French Government, which waives all taxes and duties on cars registered for visiting foreigners, and Citroën's visitor department, which negotiates special prices for tourists. This has the added advantage that the car is registered in the name of the visitor, not a rental company, and carries no identifying marks that single it out as a rental car.

The rental periods range from 23 to 175 days and include unlimited mileage, full factory warranty, comprehensive vehicle and contents insurance, 24 hour road side assistance and the support of the 15,000 Citroën dealers across Europe. The cars may be collected and dropped off at 16 different places in France for no fee and, for a small extra charge, at selected European capital cities.

Citroën and SpreeCarz have also arranged special accommodation rates at one of Europe's largest hotel chains, the

Ibis network, with room rates starting from just \$55 a night per person.

'There is no better way to explore Europe than a freewheeling, go as you please holiday, where you can explore the back roads and live like a local in your own Citroën,' says Miles Williams. 'And at these rates, car and accommodation is hardly any more than it would cost to travel around Australia. It's an unbeatable offer!'

MELBOURNE MOTOR SHOW DEBUT FOR THE NEW CITROËN COUPÉ

The Citroën Xsara Coupé will star at the Melbourne International Motor Show [26 February – 8 March 1999], prior to its mid-1999 launch, bringing a new form of European style and performance into the small car sector of the Australian market.

'Three door versions of small cars, and in particular, hatchbacks, tend to be rather disappointing vehicles,' says Miles Williams, General Manager for Citroën in Australia. 'They lose two doors and gain nothing in style. Not so the Citroën Xsara Coupé. It offers a unique package of European performance and style, blended together to offer something more, not less, from a two door car.'

While based on the Xsara hatchback launched in August last year, the Xsara

Coupé brings together the interior space of the normal hatchback with a graceful and purposeful coupe exterior. Powered by a 120kW 2.0 litre engine, the performance matches the purposeful styling with a top speed of 220 kmh and the ability to dispatch the dash to 100 kmh in just 8.7 seconds. Citroën is looking at 1.8 litre Xsara Coupé for Australia.

The fully independent suspension includes passive all wheel steering and it has been set so that Citroën's unique reputation for ride quality is balanced by a more sporting level of handling and steering response. As such, it represents an ideal set up for Australia's demanding road conditions.

Equipment levels are also high: Power steering, airbags, transponder equipped alarm and immobiliser, central locking, alloy wheels, electric windows and pollen filter all illustrate the range and depth of standard features.

'The Xsara Coupé is a fine example of the way Citroën thinks about car design,' says Miles Williams. 'Where other companies follow the tried and tested route, Citroën goes the extra mile to provide more benefits to ownership, be they in style, performance, comfort or value for money. When the Citroën Xsara Coupé arrives in Australia later this year, it will provide a unique addition to the range of choice in the Australian market, and not just another 'me-too' car.'



classifieds

CARS FOR SALE IN AUSTRALIA

XANTIA ESTATE — 1997

Hermes Rouge 5-speed manual. Fitted with every option under the sun. Top of the range, glass electric sunroof, CD stacker, cruise control, VSX style interior, Citroën immobiliser, 16valve motor, and the only original Citroën estate towbar in the country etc. etc. Still under new car warranty, Stunning car in immaculate condition. 40,000 km only [mostly country]. Must go to a caring home. Reluctant sale due to lease role over on new vehicle [you know all that tax effective stuff]. OIV 936 [Vic. Reg'n]. Save \$10,000 on new replacement cost. \$37,000.

Contact: Peter Fitzgerald Tel: [03] 9696 0866

CX 2200 — 1975

Silver paint with cloth interior. Reg'n FNK 880 Overall in fair condition. Able to view the car in Surrey Hills, Vic. Asking \$ 2500-00 or near offer. Deceased estate.

Contact Rosemary Buchanan Tel: [03] 9836 3075 [F/M]

5CV — 1922

Polished aluminium boat-tailed roadster. Well known VSCC car. Full, ground-up restoration. Engine and gearbox professionally rebuilt. Wire wheels rebuilt, inc. new rimes and spokes. New 2.75 x 21 tyres and tubes. Dark green upholstery with matching carpet and trim. Handbook, road tests, parts book [en Français]. No expense spared. All receipts etc. Car starts, stops, steers as you would expect. Club registration. \$15,000. Featured in 'Front Drive', Vol. 22, Issue 4. [M/J]

2CV6 CLUB — 1980

[See page 19 of Jan/Feb issue of 'Front Drive']. Yellow and black, VGC, very reliable and economical, 104,000miles, heaps of spare parts and service parts, well maintained and serviced. Study reasons [PhD project] necessitate frequent, long distance travel and a modest lifestyle. Trade in of a new and small [Asian] car will therefore be considered. Car is \$10,500 and parts [new tyres, oil filters, points, belts, etc.] and books \$800. \$11,000 the lot. Reg'n: OAO 090

Contact Adrian Schoo, 29 Haverling Lane, Strathfieldsaye, 3550 Vic. Tel: [03] 5439 3261 [A/h], [03] 5442 4044.

Email: proact@netcon.net.au [M/J]

NORMALE — 1953

Left Hand drive. Club registration in Victoria [CH 3477 — Not transferable] Older restoration in Vietnam. Drive shafts and front end work to return to original recently. Black/creme paint. Vinyl interior. Mechanically in fair condition. A complete and unique car for use on club registration as is or for a rewarding restoration project. Comes with a spare ID19 motor and gearbox for four speed conversion if required. \$8,000 or near offer.

Contact the owner Ted Cross

Tel: [03] 98192208 [J/F]

CX 25 GTi — 1984

Excellent condition. Fully reconditioned. 5 speed manual. Black leather interior [fair], air con, power steering, Alpine CD, cruise, sun roof, Tow bar. new brake pads and disc rotors. Factory mags. Needs tyres for RWC Inspect at Paris Motors in Richmond Vic CBG 438, \$14,000

Contact Stephen Collett Tel: [03] 9531 6226 or mobile 0417301493. [J/F]

For more info on the five cars below contact Bert Houtepen.

Tel: [02] 9746 9920 or mob. 0412 141 668 [J/F]

2CV SPECIAL — 1988

White. Reg'd July 1999. Everyday car needs TLC and a good home. Reg. TUD 350 Fuss pots need not apply. \$6,500 [J/F]

D SPECIAL — 1974

White. 12 months reg. Mechanically very good. Has had a kiss in the rear and would benefit from replace/or repair of rear guards [I can supply two good rear guards] Reg. BI] OOV It is a very good every day car as is. Chassis is rust free! \$2,700 [J/F]

2CV — 1958

Ripple Bonnet 2CV Body. Red. Very good condition LHD. Would make a good club car. Engine is a bit tired but it goes. Chas. 02448426 \$7,500 [J/F]

BX 19 GT — 1986

5-speed, velour, good condition. The last of the real Citroëns. ie, Dash, Single spoke wheel, Reg. OEY 169 Nov 1999 \$7,900 [J/F]

VAUXHALL CRESTA — 1962

White 6-cyl. Very good original car presently on club plates. Ideal for sons and daughters who hate Citroëns. Reg. 015 [Club] \$2,900.00 [J/F]

LIGHT 15 — 1953

Chassis No. 771692. 34,000 original miles only, Log books, workshop manuals, original registration plates on retention [NSW] Maroon. Immaculate condition

Contact Arthur Pike. Tel: [02] 4388 5851 [J/F]

CX 2400

4-speed Pallas. New white paint, better than average interior with new door trims Reg. OVO 061 12 months reg. & RWC \$4,000 ONO

Contact Carey Motors. Tel: [03] 5152 1040 [J/F]

COLLECTIBLES & PARTS FOR SALE

TRACTION RESTORATIONS AUSTRALASIA

4 cyl & 6 cyl Traction reconditioned engines and gearboxes

Short or Long engines, standard or modified.

Reconditioned ID engines & gearbox', Short or Long.

Reconditioned 4 & 6 cyl Traction Front Ends, complete.

Reconditioned 4 & 6 cyl Traction front Ends, Silentsblocs only.

Reconditioned 4 & 6 cyl Traction & ID Water Pumps

Reconditioned brake master/wheel cyl's

Relined brake shoes

Part engine rebuilds, to customer requirements [Top or Bottom end]

Reconditioned Driveshafts, 4 & 6 cyl Traction with modern CV joints

All the above are offered on a changeover basis.

Carey Motors P/L

Phone Mel on [03] 5152 1040, Mob: 0412 526 126 or Fax [03] 5152 2615 [A/S]

VINTAGE PARTS.

Set of new Citroen "Rosalie" pistons. Inquires in the first instance to Carey Motors 0412 526 126 [J/F]

LIGHT 15 PARTS

Original Light 15 engine and gearbox
Light 15 complete grille, newly chromed
Light 15 bumper bar [narrow] and strand also
water pumps, generator and starters.

For full details call Howard Burrage,

[03] 5495 2094 [S/O]

WANTED

DS 19 PARTS

Front panels — guards, underpan and bumper — preferably with Pallas auxiliary driving lights. Can exchange with Chapron-style auxiliary lights and some cash. Prefer second series [post-1966]

Contact Philippe Mortier.

Tel: [08] 8278 3775 or email at mortierp@ozemail.com.au [J/F]

DS 23 EFI 5-speed Pallas

Carey Motors Fax [03] 5152 2615 [J/F]

OVERSEAS SALES

C6F COUPE DE VILLE — 1930

Very rare car. Excellent older restoration. All original and complete. Asking price US\$30,000 or best offer. More information and picture available. Contact Pier Marta Fax: 0054 11 4642 5894 Email: rdchiate@intramed.net.ar



talking technical

SPARE PARTS OFFICER — MEL CAREY

OLDER-CARS VENDETTA

Now that terms of reference are being amended for an inquiry into older cars, the RACV stands firm: we oppose higher registration charges and annual inspections for older vehicles.

Fact: Five out of six cars bought and sold on our roads are used cars.

Fact: Of all used cars 50% are 10 years old or more.

Fact: The average is 10.6 years old.

Fact: By 2000, 58 percent of cars on the roads will be 10 years old.

It is a politically-created myth that Melbourne's air pollution problem is caused solely by these cars. Annual inspections, if introduced, would cost motorists \$260 million! These costs would outweigh benefits three to one. There is no justification for any old-car new-car inquiry — the solution is voluntary annual tuning of all vehicles.

David Cumming,
RACV manager government relations.

NEWS FROM THE NETHERLANDS

Within the Dutch Traction Avant club, we have commenced work on the remanufacture of spare parts for the very first Traction models — 7A, 7B, 7C, 7S and 11A. This covers cars built between 1934 until 1938/39.

The parts under consideration for remanufacture are:

- 🚗 Steering box 602027
- 🚗 Rear light fitting IN the rear wings 181005 and 707205

- 🚗 Repair sections for small front wings
- 🚗 Door rubber stops, square model with Citroën logo
- 🚗 Downpipe through the front horn — 305366, 305928, 305958 and 305959

Please indicate any interest in

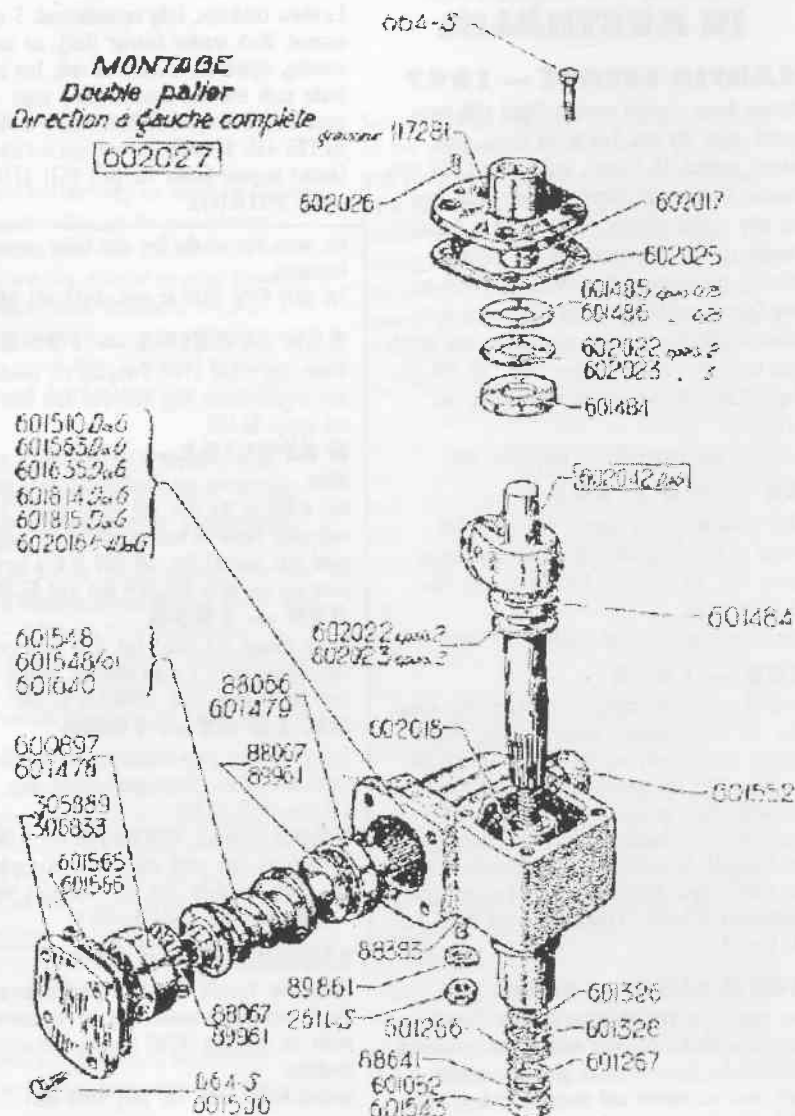
HOW TO CONTACT MEL CAREY

PO BOX 469, Bairnsdale, Victoria, 3875. Australia

Fax: [03] 5152 2615, Mobile: 0412 526 126

E-mail address; citroencarey@net-tech.com.au

Please note Mel's
corrected email
address!





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