From CUR to PIJ

The eTug story at GCV

By Robert Pugh

In 2009, I was Tug Master at the Gliding Club of Victoria (GCV), having taken on the role in 2008. I had taken over that position from the then Tug Master Bruce Salter. During 2008 just before I took the reins, Bruce had negotiated to bring a new tug aircraft to the club.

It was a Pawnee aircraft but had been converted to house a V8 General Motors automotive engine. The eTug, as it was called, was not the first of its kind. This concept had been done before. The version that I knew of was called Auto Tug. It had been created in an effort to bring down the cost of aerotowing, but had limited success. I never saw the aircraft operating, but I had heard that it was plagued with issues and was not thought to be a viable alternative to the Lycoming engines that were fitted to our Piper Pawnee tow planes. This particular experiment used a Chrysler Javelin V6 engine.

Gliding Clubs all over Australia had been involved in basically two types of launching, being aerotow and winch launching. Aerotow launching was, and still is, regarded as the best means of launching gliders, but it is expensive when compared to the winch launch. Therefore, usually, only the more established and larger clubs used aerotow to launch their membership.

The eTug Group Pty Ltd (being Michael Shirley and Ian Roache) were the owners of the new addition to our towing fleet and following some lengthy discussions, a cross hire deal was accepted by the owners and GCV. VH-CUR (the eTug) entered service at Benalla in April 2009.

CUR had been converted to house a General Motors LS1 V8 engine – these engines were generally called “350 Chevie V8s”- and this version, that was used in Australia to power the 2004 – 2007 Holden Commodores had been taken second-hand from a 2004 VY Commodore sedan and had a capacity of 5.7 litres.

The engine had been completely stripped down and inspected prior to its installation and was fully balanced (meaning that the pistons were balanced to ensure better performance) prior to it being installed into the VH-CUR Pawnee airframe. That occurred in 2006 and at that stage of the eTug story, CUR – the eTug – entered service at the Lake Keepit Soaring Club. According to the aircraft log book, CUR was in service at Lake Keepit for only 200hrs before it was cross-hired by GCV here in Benalla. I became aware that the owners wanted to move CUR from Lake Keepit, and had chosen to contact GCV as her new home because of the number of hours that she would fly each year. CUR was registered in the Experimental Category as a prototype and the eTug Group wanted her to fly as much as possible. The end game here was that, once proven to be safe, and with CASA convinced of this, more

eTugs could be produced on a commercial basis and the conversion to the automotive engine offered to gliding clubs across Australia as a viable alternative to replacing their expensive Lycoming engines when the time came.

As those of you who understand CASA – and any regulating Government body – the process of bringing in change is a slow one. CUR was breaking new ground. The thought of an automotive engine in an Australian Registered Aircraft was met with closed doors and "it's never gunna happen" attitude. But, the eTug Group pressed on. Year after year of successful – and safe – operation of the tug was documented and submitted and yet ultimately refused, again and again, by the regulator.

However, Michael Shirley and his partner Ian Roache are persistent men and with their motto "for the good of gliding" the eTug project continued. It was not all smooth sailing for those of us involved here at Benalla. There were setbacks along the way. These were not actual failings of the aircraft or the engine, but research and development issues that needed to be addressed. As eTug Co-ordinator here in Benalla, I took on the role of not just addressing issues of management of CUR, but also became very much involved in her day-to-day maintenance and improvement.

When issues arose, such as cracking in the engine mount, or coolant leaking from hoses, I attended to whatever I was "allowed" to attend to (CASA pilot allowed maintenance) and then co-ordinated necessary attendance of our maintenance workshop or outside engineers to address the issues as they appeared. With each repair or improvement, the aircraft became better and more and more reliable. The eTug – since arriving here in 2009 – has clocked up over 1,100 hrs of airtime and has matched the hours (or in some cases done more hours) than BXP or MCF in any particular year. The cost of parts is far less than for a Lycoming engine and the accessibility of those parts is so much simpler. Most of the engine parts or filters needed to run CUR are available at Repco or Coopers here in Benalla and come at far less cost than any similar required part for a Lycoming engine. This was proven beyond any doubt recently when CUR's engine was re-built. The engine had clocked up 1,300 hrs in airtime and had been used in a motor vehicle for about 500 hrs (estimated) prior to that installation. The engine never actually "stopped" but I withdrew her from service owing to reports from oil analysis and advice from our engine maintainers. The total cost of re-building the engine, extraction and re-installation was just under $12,000.00. Had it been a Lycoming engine, the replacement cost would have commenced at $55,000.00 just for the engine!

Moreover, the cost of fuel for the eTug is also far less, and because we are a "not-for-profit" sporting organisation, every litre of fuel that we use in CUR attracts a fuel tax credit from the Federal Government. (Just as a small aside here – it was Michael Shirley who first alerted GCV to availability of this fuel tax saving, that results in an annual benefit to GCV of over $1,000.00 from CUR alone. It was also the use of MOGAS and the savings and benefits of that fuel that drove me to convert BXP and MCF to MOGAS in our recent history).

So, let's fast forward now to 2017. CASA finally relented (probably because of the RA-AUS registered aircraft becoming self governing and the delegation of CASA's

responsibilities to Self Administering Sporting Organisations like the GFA and Warbirds) and allowed the eTug Group to build a second eTug.

Michael had always hoped the he would be allowed to build another V8 conversion. It must be said here – and recognised – that the CUR prototype and development had cost a lot of money, but the project was never about personal financial gain. I'm not in a position here to divulge just how much the syndicate has poured into the project – that is a matter for them – but let me tell you all that it's a very large amount ! Michael and Ian had another Pawnee aircraft waiting in the wings for when CASA allowed them to build another. Enter Piper Pawnee VH-PIJ.

However, the eTug Group needed a workshop and a base for this – and hopefully other conversions – to be produced. I suggested GCV and that was accepted warmly by the Group, but owing to our circumstances back then – in 2016 – Graeme Greed, our longtime LAME and glider engineer had decided to step away from powered maintenance and wanted to focus only on the glider maintenance that GCV had to offer him. So, to make this all happen I had to find another Licensed Engineer to take over the power workshop. I did find Simon Jackson, but, unfortunately, Simon left GCV in August of 2018, after having commenced work with us in October 2017. In those 10 months, Simon was able to progress the conversion work to PIJ. He mounted the engine, and designed, built and installed the radiator and fuel systems.

When Simon left GCV in 2017, I was left to locate someone who could take over as our engineer and continue work on PIJ's conversion. That was not an easy task, and owing to my inability to locate a LAME to take over the GCV workshop, the powered workshop (an approved CASA facility) was closed recently. But, thanks to my connections with the Lilydale Airport, I found Don Gordon.

Don can best be described as an aeroplane enthusiast. He is not a Licensed Engineer, nor does he have any officially recognised qualifications in that regard – but – he has restored Tiger Moth aircraft and hand-built a Titan T51 Mustang replica that was powered by a General Motors V8 engine. He has his own extensive and beautifully equipped workshop and after meeting with him and getting his acceptance to continue the project, Michael came down from Sydney and from that discussion, VH-PIJ had a new home base. All we needed to do was to get PIJ down to Lilydale. (Another interesting aside here is that I moved to Benalla to live with my partner Rita in November 2018 after having PIJ in Benalla for the preceding 12 months. PIJ moved to Lilydale in December 2018 – so I still had the tyranny of distance to deal with the co-ordination of the ongoing work !)

With PIJ now in Lilydale and with Don at the helm, the work to complete the conversion progressed quickly. Don, assisted by his son Ross, completed the work and PIJ's engine ran for the first time in February 2019. From then on, until the present date, Don had designed and installed the instrument panel, conquered the issue of the engine computer system (remember it's a car engine and it needed to think that it was still actually in a car!) along with fitting and restoring the brakes, airframe and control surfaces to a point where a Licensed Engineer (enter Steve

Hobby) would issue a Maintenance Release that would enable the aircraft to legally fly.

Whilst all this was happening, Michael and Ian were endeavouring to understand and deal with the landmines that were always in place to get a Certificate of Airworthiness for eTug number 2. After nearly two years since PIJ's work commenced, a way forward with the Australian Warbirds Association was found. Ian had found that the Warbirds, being a recent addition to the Self-Administering Sporting Associations were able to issue these types of certificates, without the intervention of CASA. So, it had to be easier – and it was!

Michael and Ian made contact with Peter Pring-Shambler, from Warbirds, who is a delegate of CASA and had the power to issue Special Certificates of Airworthiness to proven aircraft. It was hoped that CUR had sufficiently proven herself and that PIJ was so close to a copy (with some improvements) that a Certificate could be issued on that basis. A comparison was needed and so on June 2 I flew CUR down to Lilydale so the two aircraft could be seen side by side by Peter.

Following that inspection, CUR was passed for Certification and we were told that a Special Certificate of Airworthiness was to be issued. Further to that, both CUR and PIJ were going to be taken out of the experimental category and both aircraft were to be issued Special Certificates in the LIMITED category, specifying Glider Towing as the primary purpose. This was great news to Michael and Ian who had worked since 2004 on the eTug concept.

As I write – on this rather wet and cold Benalla day (12 June 2019) I am waiting for confirmation that the Certificate for VH-PIJ will be issued today. Once issued, I can get the Maintenance Release from Steve and the plan is to commence test flights of the new eTug PIJ at Lilydale on Saturday. Once that is done, the first ever automotive V8 conversion to an Australian aircraft, that can also be offered to others on a commercial basis, will have been achieved. A milestone in Australian aviation history and a boon to gliding clubs all across the country who can now benefit by getting their Lycoming engines replaced by cheaper, stronger, more efficient and more economical water-cooled automotive V8s.

Its been a long road for all those involved – including me – but as Michael and Ian keep telling me, the motivation for all of this has been for "the good of gliding". Michael and Ian have no commercial motivation for this, but, if they can get some of their money back, that will be the icing on the cake.

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