AIR CTI
THE ULTIMATE
Tyre Pressure Managment System
TYRE TORQUE

Issue: 2 November 2017

The team at AIR CTI welcome you to the January 2018 edition of our company newsletter,

First and foremost, the AIR CTI team wish everyone a fantastic 2018 and hope that you will achieve all your chosen goals.

There has been no rest for many of the AIR CTI team during the Christmas period. We needed a skeleton staff working full-time just to keep up as we fielded numerous inquiries all while sending out multiple kits and completing several fit-ups.

Our Managing Director, Chet Cline, Workshop Manager, Stuart Vikis and Sales Manager, Andrew Kee basically only had Christmas Day, Boxing Day and New Year Day as holidays such was the demand for a product! Only last week two of our team were at the office until late translating the Fitting Manual into Russian so we could assist our client in Latvia with his first fit-up.

AIR CTI received inquiries from India, Slovakia and Kazakhstan (I didn't have a clue either – apparently it is west of Mongolia and north of Uzbekistan). I find it incredible that a company in Moe Victoria is now exporting a product – made in Australia, designed in Australia, tested in Australia – to a country that, one week ago, I didn't even know existed.

So how do people in these countries know about Central Tyre Inflation systems AND how do they know to contact AIR CTI in little old Moe in Victoria?

The answer is, simply because the rest of the world has woken up to the benefits of using optimal tyre pressure and the best place in the world – yes you have read that correctly, IN THE WORLD – to buy the most cost effective, quality engineered and efficient Central Tyre Inflation system is in Moe, Victoria, Australia.

AIR CTI was told that a Central Tyre Inflation system would never work in the heat, dust, floods and extremes of outback Australia, so, just to prove everyone wrong, AIR CTI went out and beat the supposed 'unbeatable' Tanami Track. AIR CTI is now part of many road trains throughout Northern Australia. But not content to stop there, this little Aussie Battler then took on the rest of the world and now unequivocally provides the best Central Tyre Inflation system anywhere.

Central Tyre Inflation Grand Final

AIR CTI (The Tanami Track)	**1**	**0**	**The Rest of the World** (Too hard so we just gave up and went home with our tail between our legs)

Nevertheless, AIR CTI would not be in this position without the support of some exceptional people in the La Trobe Valley. One of these individuals, and we at AIR CTI speak of him with nothing but respect for his intellect and brilliance, is Mr Ian Jackson of Alian Electronics. Such is the regard for Ian that we asked him how he became involved with AIR CTI. Please read and enjoy!

Until next month, look after yourself and enjoy 2018 as its going to be a great year!
The AIR CTI Team

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100% OWNED & OPERATED

Good technology will always follow the needs of its users.

The development of the CTI control system. Ian Jackson, Alian Electronics

About five years ago I was contacted by Chet Cline, the principal of the Air CTI company with a view to updating the CTI product controls. For the preceding 25 years I had been doing electronic design and engineering work across a wide range of industries, but tyre inflation technology was a new one for me. The CTI company had already resolved the hard issues around shifting air in and out of spinning tyres and had many vehicles in the field with working systems. However, it was very much an analogue control method that required lots of customisation between truck types. This also made it tougher to support clients at remote locations.

Getting the air into the wheels

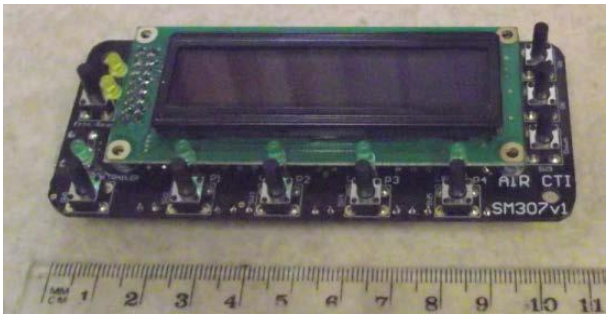
A difficulty highlighted by installers was the need for fitting air pressure lines all the way to the truck dashboard, so that live tyre pressures could be seen. Running this pipe work in cramped conditions significantly added to the installation time.

I was given a brief to see what sorts of improvements could be made to the system. My study took some weeks to complete. I looked at a few trucks, saw how they were being used and discussed the common problems experienced by installers. This is the usual process. Clients will know what they want in broad terms, but what is really needed is not resolved until a few loops of test and trial take place. The difficulty is that it must all happen without putting client assets and business reputation at risk. This is the eternal paradox of product design. You don't get to learn how to swim by staring at a pool. Sooner or later you have to get into the water.

Original control style

The next step is the application of imagination. What would an alternate CTI control system look like? How would it feel for the operator? What would it do to the installers? How readily can it be supported from the far side of the country over a scratchy phone line? The list of essential requirements grew longer.

It is possible for the operator console to be mounted separate to the rest of the wiring and sensors. The electrical connections can then be tucked out of sight, so that the part that the driver sees is fed by a single thin cable. A display screen is needed that is easy to read at a distance, day or night. While rotating knobs were a feature of the earlier systems, pressures can be hard to fine-tune on a bumpy road. It's better to pre-load some driver preferences which may be engaged with single button press. The electronics need to be smart and self-diagnose a wide range of problems that can affect vehicles in harsh conditions.



Inside the display

Software updates have to be easy. If a special update is needed to meet some new conditions, it has to be done by posting a replacement chip in the mail that anyone can change. This approach is much better than sending a truck to a support depot a thousand kilometres away. From these and other criteria, the design for the new CTI product began to emerge.

TECHNICAL TALK

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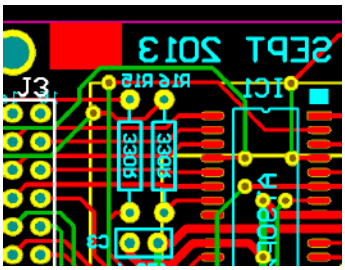
Good design does not occur in isolation. Someone from the outside can never just enter the scene and create the perfect product. It has to be a collaboration with everyone who has worked within and absorbed the essence of the industry. It is their experience that will determine what will fly and what will infuriate. To that end, this new design was a composite of ideas from a dozen people and some fresh imagination. The trick is to bring it all together.

With a sketch in place for what a new control product would look like, design processes shift to the PC so that these ideas can be converted into hardware that works. The first step is to develop new circuit boards that will accommodate this plan.



Circuit board design is complex work. It is an art form where many different elements of available parts and available room merge with a microprocessor that can handle the job. Every copper track must go to the right place and nowhere else. Its final shape must fit snugly within the selected space.

This new CTI product required a unique enclosure that would suit most vehicle installations. Rather than the conventional moulded plastic, this one is made from a tough fibreglass material. On the front of the operator console is a customised label with raised button areas to make it easier for drivers to feel their way around the controls under low-light conditions.

Only after all of this essential hardware is ready can the next step of the software design begin to take shape. This is where the real magic occurs.

The two yellow lines of text that appear on the display barely reflect the nine thousand lines of program code that lies behind it. As every word in a good story must convey a meaning, every item of code must make a choice or perform a task. But like a story, good software requires structure. When power is connected, the program must wake up in just the right way, find all of its favourite stored settings, test itself and tell the operator exactly what is going on.

A new operator console was born

So the design was launched into the field in 2013. The transition away from a rotating knob for a pressure setting was controversial, but rapidly accepted. The concept of pre-loading three favourite pressures in memory, then pushing a single button to choose the one you need was an essential development. The bright yellow OLED display is easy to read in the daylight. It informs the driver exactly what the pressures ought to be and where they are now. Carefully written background features are constantly looking for anything out of the ordinary. Is it taking too long to inflate? Is there a slow leak somewhere? The great aspect of a display is that problems can be reported in plain English text, rather than ambiguous beeps and flashing fault lamps. This makes the entire system much easier to support at a distance.

Trial CTI fitted to my 1984 L300 van

Lurking in the background are about seventy different settings that allow the staff to fine-tune any new installation. Some fleet owners don't want their drivers to make changes, whereas some owner-drivers want to dive in and make fine adjustments on the fly. Selectable levels of access and security can accommodate all of these situations.

A development version of the CTI system was fitted to my old 4WD Mitsubishi van. It allowed the dynamics to be tested in real time. While it gets a few odd looks, it has made quite a difference to the places it can go and the hills it can climb.

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The first year of its launch was a busy one. It worked well, but several suggestions that came from installers and operators were carefully introduced. There are way too many features to dwell upon in this short article, but it does highlight the beauty of developing a new product close to the front line. Australians are great problem solvers and advice from people in the field is always worth listening too.

When the first 1000 trucks were fitted with this new technology, we celebrated with a lumpy cake, which although tasty, did highlight that I ought to stick to electronics and not venture into the kitchen too often.

The Air CTI team celebrate 1000 installations of the new electronic controls

The team in Moe, to the east of Melbourne, have created a bold new enterprise out of thin air (or at least 30 psi) that is delivering safety and efficiency to the trucking industry around Australia. The rest of the world is very interested.
Of the many technologies I have become involved with, working with Chet Cline and his crew on their CTI systems, have been one of the most satisfying. They continue to push the boundaries of problems into fresh ideas and new products. It's great to see this in action.

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