

Civilian Aircraft.

Avalon 2013 attracted many aircraft manufacturers, all keen to take orders for their wonderful aircraft. Some produced super luxury machines, some work horses, some small commuters and although most were fixed wing, the rotary wing boys were there too, all hopeful of a sale. There were also aircraft that were there just to be seen, some used to serve in the defence of the country, others that were once state of the art transporters and some that were so small that one wondered who would venture into the wild blue in such a contraption.

And as diverse as they were, they all drew huge crowds because they were aircraft – from the days of Orville and Wilbur, the public has held aircraft and those that make and fly them, in awe. They still do!

Here are just a few of those machines.

Embraer Lineage 1000.



One aircraft that fitted the luxury tag with ease was the Brazilian Embraer Lineage 1000. The Lineage is an ultra-large executive jet based on the Embraer 190 regional jet airliner which is flown in Australia by Virgin Blue. Costing about \$43 million, it supposedly surpasses equivalent aircraft in range, cabin size, baggage space, and the ability to indulge.



The Lineage's cabin is double the size of any aircraft with comparable range which is a very useful 4,200 nautical miles. Depending on the seating configuration, the five-zone cabin can carry 13 to 19 passengers and 2 or 3 cabin crew. With a stand-up height of 2 metres, a width of 2.7 metres and a length of 27.5 metres it is a very comfortable aircraft.

Depending on a purchasers' taste, needs, use and size of pocket, there are hundreds of ways to customize the configuration for the ultimate accommodating environment. The cabin is split



into five distinctive privacy zones and includes complete audio and entertainment systems, as well as a fully equipped wet galley as standard. Plenty of swanky options are available including three toilets and a stand-up shower; a queen-size bed and of course high-speed internet connection to accommodate the on-board business executives.

It will cruise at 470 kts, needs 6,660 feet to become airborne with a maximum take-off weight (MTOW) of 120,150 lbs and has a ceiling of 41,000 feet. Embraer chose the whopping General Electric CF34-10E7-B high-bypass engines to propel the Lineage, each of which produces 18,000 lbs of thrust.

Embraer's toe-dip into the business jet market has proved to be a flying success, evidenced by the Phenom (seen at Avalon 2011) and Legacy series, and now the Lineage.

Gulfstream G650



Another aircraft that deserves the luxury tag is the Gulfstream G650. Built by Gulfstream Aerospace in the USA, the G650, which first flew in 2009, will carry from 11 to 18 pax, cruise at 485 kts for 14.5 hours and cover 7,000 nautical miles. Its max ceiling is 51,000ft.

It can be ordered with a full kitchen and bar and a variety of entertainment features including satellite phones and wireless Internet and is powered by the new Rolls-Royce BR725 engines, each producing a maximum thrust of 16,900 pounds.

The G650's cabin is 1.96 metres high and 2.59 m wide and to keep the weight down, uses composite materials in the empennage, winglets, rear pressure bulkhead, engine cowlings, cabin floor structure and many fairings.

As is becoming the norm these days, the aircraft controls are completely fly-by-wire. There are no mechanical control cables between pilot and the flight surfaces which are moved by a dual hydraulic system.

The GA8 Airvan.



The GippsAero GA8 Airvan is an important Australian designed and manufactured high wing, 8 seat, utility aircraft specifically engineered to meet demands of remote operations from unimproved strips. No other aircraft in its class measures up to the stringent safety, design and airworthiness requirements to which the Airvan is certified. No other aircraft in its class can match the load carrying capacity or its flight handling characteristics.

The easily operated sliding door allows clear access to the cabin with the flaps either up or down and the floor height is perfect to allow for easy loading and unloading from a ute or four wheel drive. The large door, which can be opened in flight, allows the GA8 to be used in a number of roles such as skydiving, supply dropping or other military and/or law enforcement tasks. It also makes loading items as large as 1m x 1m x 1.2m a breeze. The main landing gear is located further aft than on many comparable aircraft meaning that the floor angle remains constant during loading and unloading with no tendency to tip onto its tail. The aircraft can be ordered with or without the cargo pod.

The owners planned the normally aspirated piston-engined GA8 to fill the gap between the Cessna 206 (one of the world's best workhorses) and the turbo Cessna 208, improving an owners' profitability without going to the expense of purchasing a turbine powered aircraft.

In October 2006, they announced that a turbocharged version of the aircraft had commenced flight testing. This aircraft, to be named the GA10, has been stretched to seat 10 people and will carry an increased payload. In June 2008, they said they were giving serious consideration to re-building the little 18 seat Nomad, to be named the GA18, though with different engines, propellers, and a glass cockpit.



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All this activity required additional funding and in Dec 2009, Mahindra Aerospace, part of the giant [Mahindra Group](#) of India acquired a 75.1% majority stake in the Company. Although the GippsAero company's future now seems assured, let's hope it stays in Australia.

Performance:

	Normally aspirated	Turbo Charged
MTOW	1,905 kg	1,905 kg
Max useful load	783 kg	828 kg
Take off ground roll	420 metres	244 metres
Landing ground roll	150 metres	147 metres
Cruise fuel consumption	57 lt/hour	68 lt/hour
Endurance (no reserve)	8.5 hours	8.2 hours
Range	546 nm	567 nm
Rate of climb (MTOW)	731 ft/min	905 ft/min
Stall speed, full flap	57 kt	57 kt
Ceiling	15,500 ft	20,000 ft

Cessna 182



One little aircraft that needs no introduction is the Cessna 182. This little 4 seater aeroplane, which when first produced back in 1956, was really a C180 with a nose wheel. Over the years it has undergone many improvements, such as a wider fuselage, swept vertical fin, bigger back window, more luggage room, higher gross weight and improvements to the landing gear.

In 1985, Cessna became a subsidiary of the General Dynamics Corporation and very soon after stopped producing single piston-engined aircraft due to concerns over product liability.



Then in 1992, Textron, Inc. acquired Cessna Aircraft and as liability laws had changed in the US, soon resumed producing light aircraft. The C182 was back in production. In 1996 considerable changes were made to the aircraft, a new engine was fitted as was new seating and then the [Garmin G1000](#) glass cockpit was added. Later this year (2013) Cessna intends to fit the C182 with the French [SMA SR305-230](#) diesel engine which will run on Avtur and will burn 42 litres per hour.



The C182 is Cessna's second most popular aircraft, after the C172. Cessna has to date sold 23,237 of them and counting, (against 43,000 C172's)

DH-4 Caribou



The old Caribou might have left the RAAF, but a couple of them, both ex-Vietnam aircraft, still fly, thanks to the Historical Aircraft Restoration Society ([HARS](#)) of Albion Park, NSW. Registered now on the civvy register (as VBA and VBB) both were at the 2013 show, one on static display out the front of Australian Aerospace and another on the "keyhole" ready to put on a flying display as only a Caribou can. Bob St John, who has been around Caribous as long as anyone, was on A4-210 (VBA), the aircraft that was designated to do the display but 210 being 210 had other ideas and decided to dump copious quantities of high octane fuel onto the ground from its port wing tank.



This of course caused a bit of a stir. The Fireys, who thought dumping buckets of highly flammable fuel on the ground so close to millions of dollars of hi-tech aircraft was not on, were a bit upset about it. They brought in their big yellow trucks and ropes and poles and ordered everyone away from the aircraft. Out came the engine stands, off came the cowls, sumpies and framies swarmed all over the aircraft and you could be forgiven for thinking



you were back on the PSP at Vungers. At first it was thought one of the rubber fuel cells had ruptured (you don't just buy a new one from Bunnings either) but on further investigation it was found (luckily) it was only a flange that had let go. The little Clarktor hooked up to the nose gear and 210 was banished to the naughty corner, a spot far from other aircraft (and Mr and Mrs Public), where it was eventually repaired.



A4-234 (VBB) was withdrawn from the Australian Aerospace stand, replaced the sick 210 and put on a show for the people.

Prior to all this happening, the PBRD struck and branded the old Boo.



A4-210 (right) in the naughty corner, with a few 44's under the wing to catch any drips.

Australian Aerospace, which did the major servicing on the Caribou when they were flown by the RAAF, announced, at the show, that they had reached agreement with HARS and would support two aircraft and provide funding towards their upkeep.

Announcing the deal, Jens Goennemann, said: "These are just two of the few surviving flying examples of the Caribou, and their importance to Australia's history and heritage cannot be overstated. Their legacy is worth preserving, and I've no doubt these aircraft will prove a popular tourist attraction and a valuable historical example, particularly for younger generations and new settlers, on the important contribution the Caribou made to Australia in times of both peace and war."

Speaking proudly of the Caribous and the AusAero partnership, Mr Bob De La Hunty OAM, President of HARS, said: "HARS welcomes the addition of these two Caribous to our significant collection of Australian military aircraft in flying condition. These fit in with our charter which is to preserve and maintain aeroplanes in an operational state. As an all-volunteer organisation, we can only do this with the assistance of companies such as Australian Aerospace. For this, we are very grateful. We see ourselves as custodians of Australian aviation heritage and are very proud of what we've achieved."



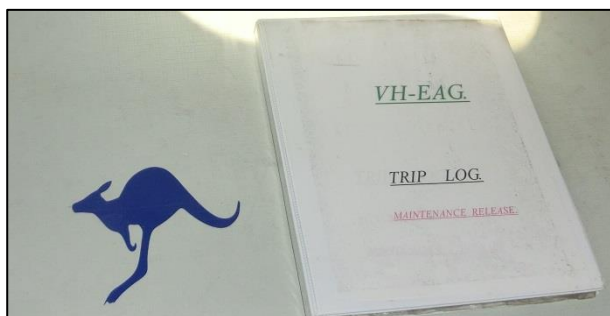
L-R: Jens Goennemann (Australian Aerospace), Bob De La Hunty (HARS), Doug Haywood (HARS).



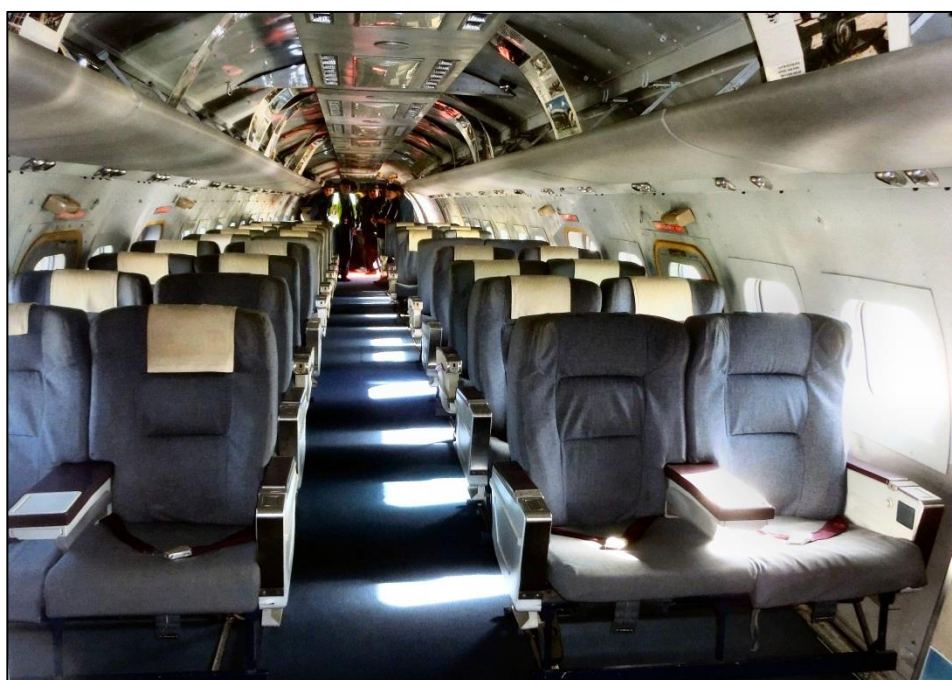
Connie



Another aircraft that is immediately recognisable is the Lockheed L-1049 Super Constellation, also owned by the HARS organisation. Lockheed built 579 of these wonderful aircraft, most of which were used by various militaries. First flown in July 1951, it started service in December 1951 and was built until 1959 when the Boeing 707 was introduced and banished piston aircraft to the back seat.



The PBRD struck the Connie also.



In the days of the Connie, flying was a luxury, people “dressed up” the seats were large and comfortable, there was plenty of room, service and facilities were first class. The jet age did away with all this, from then on operators wanted bums on seats, as many as possible. Where the 113ft long Connie would carry about 60 pax in relaxed comfort, the 145ft long B707 would jam in about 200.



Piper Seneca.



Piper's 6 seater light twin has been around for a while now. First seen in 1971, the Seneca was derived from the single engine Cherokee six. The prototype Seneca had three engines, retaining the original engine in the nose from the Cherokee six but that engine was discarded and the aircraft was produced with the two engines in wing. Early models had a few handling problems which were quickly fixed, the propellers were counter-rotated and eventually a T tail was fitted. The Seneca is popular with air charter companies and small feeder airlines and is operated by private individuals and companies.

It will cruise at 200 kts, has a service ceiling of 25,000ft (16,500ft on one engine) and has a useable load of 624 kg.

Cessna 208 Caravan.

First flown in 1982, the Caravan continues to go from strength to strength.



Powered by a Pratt & Whitney PT6A-140 turboprop engine producing 850 shp, the aircraft will carry a total of 14 persons over 1,000 nm at a speed of 190 kts. To date there has been over 2,000 built. Recently Cessna signed a JV with the government-owned China Aviation Industry General Aircraft Company and all future aircraft destined for the Chinese market will be built in China.

Socata TBM 850



The French built Socata TBM was first flown in 1988 and introduced into service in 1990. In 1985, Socata bought the US aircraft manufacturer Mooney, better known for their light single engine aircraft with the back to front tail fin. Mooney had been working on a six-seat pressurised light aircraft powered by a single 360 hp (268 kW) piston engine and when Socata started to pay the bills, they decided to fit the aircraft with a turbo prop engine.

The TBM has retractable tricycle landing gear and is powered by the Pratt & Whitney PT6A-66D, 850 shp engine giving a usable range of 1,520 nautical miles.



Bombardier Learjet 35A.



Learjet was founded by William Lear when in 1963 he built and flew the first all jet personal aircraft. In 1967, he sold his stake in the company (approximately 60%) to the Gates Rubber Company of Denver, Colorado for US\$27,000,000 and in 1969 the company was renamed the Gates Learjet Corporation. In 1990, Bombardier Aerospace purchased the Learjet Corporation and aircraft were marketed as from the "Bombardier Learjet Family".



The 35A will carry 8 pax over 2000 nm at 430 kts.

This particular aircraft is owned and operated by [Air Affairs Australia](#) who use it to tow targets for the defence forces.

CT/4

The CT/4 is an aircraft that has been derived from the original Victa Airtourer which was built and first flown in Australia in 1959.



In 1966, the Australian Government under Harold Holt, rejected Victa's appeals for tariff protection assistance and for funding assistance to keep their production lines open. The company had no choice other than to close down its Aviation Division in February 1966, by which time it had built 168 aircraft.

The manufacturing rights to the Airtourer were purchased the following year by the maintenance firm Aero Engine Services Ltd in New Zealand where further production took place until 1971. Ironically, one of its largest offshore orders came from the RAAF which purchased fifty-one uprated Airtourers (the CT4) between 1975 and 1982. These remained in service as the RAAF's ab initio trainer until 1993 and indeed, the CT4 is still being used (in Tamworth) as the basic trainer for all Australian military pilot training.

Winjeel.



Another aircraft that is immediately recognisable is the CAC Winjeel. The Winjeel (aboriginal for young eagle) entered service with the RAAF in 1955 as an ab-initio to advanced training aircraft.

It was developed by the Commonwealth Aircraft Corporation at Fishermans Bend to satisfy the RAAF's requirement for a training aircraft and a total of 62 were built and given the fleet serials A85-401 to A85-462. They entered service with No.1 Basic Flight Training School (BFTS), originally at Uranquinty, (near Wagga), but were moved down to Pt Cook when Uranquinty closed in 1958. For most of its service life, the Winjeel was used as a basic-training aircraft but a few were used in the Forward Air Control (FAC) role from 1977 until 1994.

The Winjeel would cruise at 135 kts, had a range of 475 nm and had a ceiling of 15,800 ft and was a Rad Techs dream.

Cessna 305D Bird Dog.

The Cessna 305D (Bird Dog), a development of the Cessna 170, was a liaison and observation aircraft and was the first all-metal fixed-wing aircraft ordered for and by the United States Army since the U.S. Army Air Forces separated from the Army in 1947, becoming the U.S. Air Force. The Bird Dog had a lengthy career in the U.S. military, as well as in other countries.

The greatest difference between the C170 and the C305 was the C305 had only two seats, in tandem, with angled side windows to improve ground observation. First flown in 1949, deliveries began in 1950 just in time to be shipped off to Korea. Cessna produced 3,431 of the aircraft, 3,200 of which went to the US Military between 1950 and 1959. In 1962 it was shipped off to its second war, in Vietnam, where it was seen everywhere. The last U.S. Army Bird Dog was officially retired in 1974.



Two Bird Dogs were used by the Australian Army's 161 Reconnaissance Flight operating out of Nui Dat. One was lost to ground fire in May 1968, killing 161's Officer Commanding. Another was built by 161's maintenance crew, using aircraft sections salvaged from dumps around Vietnam. It was test flown and later smuggled back to Australia in pieces, contained in crates marked as "aircraft spares". This aircraft now lives in the Museum of Army Flying at the Army Aviation Center at Oakey, Queensland.

The little bus cruises at 110 kt and has a range of 460 nm.

DH 94 Tiger Moth

What would an Air Show be without a Tiger Moth??

In the early 1930's, the RAF were looking for an aircraft in which they could train their pilots. Geoffrey de Havilland submitted a proposal which he called the DH82. The RAF liked the design and in 1932 placed an initial order for 50 of the aircraft. Later in the 1930's, as things started to look bad in Europe, the RAF ordered more and when war broke out, the RAF had 300 in service and orders were placed for more. By war's end, the RAF had ordered 4005, most of which had been built by the Morris motor company. Today it remains in widespread use in many countries as a recreational aircraft.



The Tiger was used by many nations, but the biggest users were the RAF, Royal Canadian Air Force, the RAAF and the RNZAF and in all, from 1931 to 1944, 8,868 of them were built.

The little Moth would cruise at 60 kts (about 110 km/h) and had a range of 250nm.

The Beechcraft Baron.



Another light twin that has been around for ever is the mighty Baron. Actually a Bonanza with two engines, the current Baron will carry 6 people over 942 nm at a speed of 200 kts. First flown in 1961, the Baron is a light, twin-engined piston aircraft, originally developed by Beech Aircraft Corporation and currently manufactured by the Hawker Beechcraft Corporation.

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In 1969, the fuselage was lengthened, a more powerful engine fitted, seating was improved, luggage space was increased and the aircraft was renamed the Baron 58. Since then the aircraft has been continuously improved

Lake Buccaneer.



The Lake Buccaneer is an American four-seat light amphibious aircraft, originally developed as the Colonial C-2 Skimmer, itself a development of the earlier Colonial C-1 Skimmer which first flew in 1948. Lake Aircraft purchased the manufacturing and design rights of the Skimmer in October 1959 then developed the design and produced the LA4 Buccaneer in November 1959. The original LA4 remained in production until 1972 when it was replaced by the improved LA4200 Buccaneer which had a more powerful engine, extra fuel capacity and higher weights.

The Lake will cruise at 130 kts, has a range of 710 nm and a ceiling of 14,700 ft

DC3



Another aircraft that is immediately recognisable all over the world is the indestructible Douglas DC3. Like all serviceable DC3's, this particular aircraft has a checkered and interesting history. It started life back in 1942 as a C-47 and was used as a troop carrier by the US Army during WW2. In 1944 it was sold to the then Australian Department of Civil Aviation and was entered into the register as VH-AES when it was operated by ANA for a short period as a freighter. In 1946 it was sold to TAA and renamed Hawdon and flew the inaugural Melbourne (Laverton) to Sydney route.

In 1960 it was sent to Lae in PNG, re-registered as VH-SBA and operated TAA's services up there before being withdrawn from service in 1970. It was then repainted to its original TAA colours, and re-registered as VH-AES to commemorate TAA's 25th anniversary. Then in Oct 1971, it was re-registered again to VH-SBA, flown to Melbourne and placed into storage and in 1974 it was de-registered.

In 1979, it was restored to its original TAA livery, renamed "Howdon" and placed on display at Tullamarine airport where it stayed until 1987 after which it was taken down, delivered to the TAA maintenance hangar and restored to flying condition. Once again it was registered as VH-AES.

It flew again in Sept 1988 and since then has become a welcome attraction at airshows and events around the country. Currently, Qantas help with the maintenance and expense in flying the aircraft and it is intended that it will remain in service as long as possible and will ultimately become part of an iconic collection.



Pilatus PC-12.



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The Pilatus PC-12 is a pressurised single-engine passenger aircraft manufactured by Pilatus Aircraft of Switzerland.

Pilatus announced the development of the PC-12 in 1989 and the first flight took place in 1991 with certification being completed in 1994. Since then Pilatus have built and sold in excess of 1,000 aircraft. It is powered by a single Pratt & Whitney PT6 turboprop engine driving a four bladed variable pitch prop and is certified for single-pilot IFR operations, though many operators choose to utilize a second flight crew member. At the moment it is offered only as a nine-seat airliner but a pure freight model is under consideration.

One little aircraft that has a star following on the internet and which has been seen by millions of people, is the little Cub. This light-sport aircraft, which is based on the Piper Cub, an aircraft that has been around for about 50 years, is a modernized aircraft with light-weight carbon fiber components and a 180 hp engine. This little aircraft carries two, will cruise at 105kts, stalls at 27kts and will climb out at 2,100 f/min.



You can see video of the aircraft [HERE](#) and [HERE](#).

Another light aircraft that is quite outstanding in its way is the Cirrus SR20. First flown in 1955, it is noted for being the first production general aviation aircraft equipped with a [parachute](#) designed to lower the aircraft safely to the ground after loss of control or structural failure.

A little 4 seater, the SR20 will cruise at 155 kts, stalls at 56 kts (flaps down) and has a range of 785 nm. 25 have been ordered by the US Air Force Academy.





Models.



VICTORIAN MODEL AERONAUTICAL ASSOCIATION



Members of the Victorian Model Aeronautical Association (VMAA) were there in force with many of their wonderful models. Looking at these perfectly scaled aircraft, you wonder at the thousands of hours spent by the modellers on each of them. How they are valued is anyone's guess, if the hours were counted they would be invaluable but the consensus has them valued somewhere between \$400 for the smaller ones to over \$10,000 for the larger more detailed ones. One aircraft that was flown at the show is valued at just under \$20,000 – so it definitely requires a steady hand at the controls.

These aircraft are radio controlled with the controllers operating in the 27, 29 36 and/or 40 MHz bands. 36 MHz is the band of choice.

Everyone would love to own one of these aircraft – but not everyone has the skill or the patience to be able to build one – and if you did own one, who would be game enough to fly it????



Gyro Copters.



There were quite a few gyro copters on display but the one that caught our eye was the Magni Orion 24. This little aircraft is a fully enclosed, side by side two seat, dual control machine, specially designed for those who do not want to go without comfort, even when having fun and if we were ever persuaded (or our life depended on it) to venture forth in one, this is probably the one in which we'd go. The Orion carries 82 litres of fuel which equates to 4 hours flying at a cruise speed of about 75 knots – that's about 14.5 litres per 100 kilometres.

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If you are looking for a cheap, comfortable and easy to operate aircraft, this could be just what you are looking for!!



Everyone has seen these little machines, but how do they work??

When the aircraft is pushed through the air by the little pusher (or puller) engine, air passes upward through the rotor causing it to rotate. Whereas a helicopter works by forcing the rotor blades through the air, pushing air downwards, the

autogyro rotor blade generates lift in the same way as a glider's wing by changing the angle of the air as it moves upwards and backwards relative to the rotor blade. The rotor blades are angled so that they not only give lift, but the angle of the blades causes the lift to accelerate the blades' rotation rate until the rotor turns at a stable speed with the drag and thrust forces in balance.

Logically, we reckon they shouldn't work at all!!!



Although not enclosed, the Arrow Copter is also a fine little machine.

Nostalgia isn't what it used to be.



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