FLYING THE VICKERS VISCOUNT AIRCRAFT.

November 1956-August 1960

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I am writing this story for the TAA Aviation Museum, which was established by members of the TAA 25 year club, who intend introducing an archive section to their Web page.

At the moment, in 2017, there are very few Engineers or Pilots still around, who operated this aircraft within Australia in the 1950's and 60's, so this story may be of interest.

TAA bought Viscount Aircraft from Vickers, in 1954, as their first prop jet and the number of employees associated with this aircraft during its operation are getting rather scarce due time and age. At this time we must leave some historical history available for future generations.

While working as a maintenance engineer at Essendon Airport for the Trans Australia Airline in 1954 the London to New Zealand air race was in progress and we, the employees, were all aware that the Viscount in the race was the same aircraft TAA had ordered for our fleet.

This Airliner was a Viscount built in England by the traditional aviation firm Vickers. We all gathered at Essendon Airport when the Viscount arrived. Although this was obviously a PR exercise we were suitably impressed. The most noticeable difference from other aircraft was the high pitch whine of the engines.

The following day as a fitter in the Electrical section of TAA, I was able to observe the preparations being made for the Viscounts departure on the final leg of the Air race. Planning ahead for TAA's introduction of this type, the Electrical section had assembled an especially large set of lead acid batteries to

start the Rolls Royce Dart engines on the Viscount. The battery cart was similar to our normal units; these carts were always used to start our current aircraft so it was important to test this equipment in preparation for the Viscount.

Following a ground signal by the TAA engineer the pilot pushed the start button and our battery cart proved to be a complete failure. The propeller gave a part rotation and smoke rose from below the lid of the cart. The engineers disconnected the electrical lead joining the cart to the aircraft and the pilots immediately started the engines on their own internal batteries. We later found the standard English Varley batteries installed in the aircraft were capable of producing engine starts under all extremes of Australian temperatures. TAA later bought several mobile petrol driven generators called "Red Devons" these was used on the tarmac to start the first engine then the aircraft batteries did the rest. These mobile generators were barely adequate for their task.

By the time our senior TAA pilots had delivered the new Viscount aircraft to Melbourne in October 1954 I had been accepted on the flight staff and was learning the piloting profession on Douglas DC3s. While flying DC3's on varying air routes I watched with great interest the introduction of this new aircraft type into the normal capital city flights. The Viscount replaced the Convairs and DC4s. Passengers were impressed by the smooth propeller –engine combination and its ability to fly at much higher altitudes in smoother air.

In concert with other First Officers from both Melbourne and Brisbane I gained my conversion to the Viscount in September 1957, and was very pleased to be endorsed to the new prop jet.

A pilot's conversion:

Our engineering lectures were conducted in ex- military huts located behind the large TAA engineering overhaul building. These courses were run by very skilled ground engineers and normally took three weeks to complete. They covered all the structure and systems and, on completion of the course, we did written exams.

Our active Viscount flying training commenced two months later, while awaiting this conversion training we, First Officers, reverted back to our normal

DC3 flying. MY Initial Viscount Flight training was conducted at Mangalore Airport. The content of this conversion was extensive as TAA trained all their First officers to the same standard as their Captains, which is to 1st Class instrument rating standard.

On the first training day I was directed into the First Officers right hand seat and Capt Don Winch gave me a full briefing on the complex switch panel located on the cockpit wall alongside the F/Os seat. This most unusual switch panel location precluded the Captain, in the left seat, from viewing or monitoring your switching actions. This switching panel included 4 fuel booster pumps, 4 water methanol, 3 air conditioning spill valve switches, all engine starting and propeller de-icing. The control of these critical switches could only be reached by the F/O. You can appreciate the trepidation of some Captains who preferred to action all cockpit equipment themselves. Later models of Viscount brought these system switches to the upper panel where they were accessible to both pilots. Our first flight was from Essendon to Mangalore to learn how to handle the new aircraft.

On the first day we flew 3 hours practising circuit flying and landings in various flap conditions. Pressure on us increased later when engine failure training began and we found we could only really maintain full concentration for about 1 hour. Training continued with two hours of night flying which included landing without any aircraft landing lights. This was rather difficult at Mangalore because only the runway lights were visible and there was no background lighting at this dark airport to give you depth perception. Mangalore is located 95 Ks North of Melbourne in the country. I must say that I considered this exercise relatively dangerous but it certainly honed our judgement skills.

After a total of seven hours conversion training I was allocated to Captain “Chick” Clarke for 50 hours training on normal passenger flights. Early in this training I discovered the limiting performance characteristics of this aircraft which was designed for European flying conditions. It was designed for much shorter flight stage lengths than we required in Australia. My third training flight was Melbourne to Perth via Adelaide and I discovered the Viscount had a range problem. The flight sector Adelaide to Perth was the maximum distance we could cover with our fuel range but, if the normal westerly winds increased

in strength, we had to consider refuelling at Kalgoorlie two thirds of the distance to Perth. This type of critical flight was complicated not only by wind strength, but also by the high air temperature both on the ground and in upper atmosphere. Unfortunately Australian summer temperatures can reach 52 degrees and even southern cities like Adelaide often have temperatures in excess of 40 degrees.

With a full load of passengers and extreme high air temperatures the fuel range is reduced so much that even Kalgoorlie was too far to reach with the available fuel. On this extremely hot day we were forced to plan a track from Adelaide to Forrest, a tiny town with a sealed runway located adjacent to the famous Trans Continental train line. Here we could refuel with sufficient kerosene for the flight to Kalgoorlie and then on to Perth after another top up of fuel.

The planned, strategy to gain the longest range with our fuel load, was to fly a constant indicated airspeed (175 kts) for the entire flight. As the engines used fuel the aircraft became lighter and climbed very slowly through 20,000 feet, the lower air temperatures at higher altitude assisted our fuel range. Abeam of Kalgoorlie the northerly wind drift sometimes brought warmer air from the WA desert so this would raise the outside air temp and we would sink sometimes several thousands of feet while still holding the constant indicated airspeed.

The Australian registration letters registered by TAA began with TVA, which signified T for Trans- Australian, V for Viscount and then the letters in sequence, A for the 1st aircraft. The alphabet progression eventually increased to TVQ.

TAA bought a total of 18 Viscounts. Seven 720 models, five 756Ds and the last two were 816s. A further 4 were subsequently obtained second hand from other world Airlines with surplus equipment. Vickers's built two extra Viscounts for TAA but they were never delivered. It is interesting to note that one of these two went to the Union Carbide Co. in the USA and other to Iran Air. Both eventually did come to Australia when bought by the RAAF 34 Sqd. for VIP duties.

In an attempt to improve the restricted range on the Adelaide –Perth flight sector, three early aircraft, TVD, TVE and TVF came equipped with slipper tanks

each holding 175 gallons. If additional fuel was required on a particular flight these removable tanks would be attached to hang from the outer wings. Flight endurance from to Adelaide-Perth was determined when flight planning in Melbourne and the Captain would advise the Adelaide engineers to fit these tanks before refuelling.

Among the aircrew there was considerable discussion as to the benefits of these slipper tanks. Many thought that the extra drag on the aircraft would erode some range advantage. These “Slipper tanks” had no fuel quantity gauges. When the normal wing tanks had burnt a sufficient amount of fuel the two fuel pumps in each slipper were turned on and left to pump into the wing tanks for a specific length of time. On one occasion, when we returned to Adelaide from Perth, the engineers unbolted the right hand tank and it dropped on to the barrow as it still contained some fuel. Obviously this had reduced the fuel reserve but we always carried extra fuel for such events. The two booster pumps in this tank may not have been working properly.

Only three Viscounts were designed to use the slipper tanks and these same aircraft were delivered to us without automatic pilots. The only alternative was we pilots to hand fly them constantly, and to make it more difficult we were using the Creep Climb flight techniques west bound. When hand flying, any movement of passengers and flight attendants along the cabin required you to use subtle pressure changes on the elevators and retrim.

When hand flying on the return flight from Perth, when extended range was not a factor, we were able to fly a constant altitude throughout the night. Departing Perth at 2am and landing at Adelaide at 6am on schedule we did 4 hours of instrument flying in the small hours of the night. After a one hour break in Adelaide, where we ate our breakfast, we departed for Melbourne arriving at 9am. On this leg with the sun coming up in your eyes it required a positive effort to concentrate.

The first seven Viscounts, TVA to TVG, were delivered without auto pilots, because, when the instrument specifications of the TAA aircraft were being finalised’ the TAA radio engineer was sent to Vickers in Weybridge to select our instrumentation. The new Sperry zero reader was presented to him as an advanced flying aid and he bought this instead of an auto pilot. The Sperry

hard sell demonstrated to him pilot guidance to hold an altitude and a heading in flight. As our TAA operations division required “creep climb “procedures for fuel range, the altitude function on this instrument was useless, leaving only the heading function

Even when the first aircraft fitted with auto pilot was delivered (VH-TVH) we still flew the older manual control aircraft to Perth as only these aircraft were fitted with the slipper tanks.

The hydraulic braking on early model Viscounts had a strange characteristic. There was a delay between initial application of the brakes and the aircraft decelerating. It became second nature to squeeze the hand braking control and then immediately release the pressure and then reapply it... Subsequent applications produced the required level of braking.

The Nth – Sth runway at Essendon had just enough length to be used for normal operations, this length (5400 feet) required us to touchdown early, then with normal to heavy braking and we used almost the entire length of the runway. After touchdown we always selected “ground fine pitch” on all 4 engines but the rounded tip propellers gave rather minimal drag.

We rarely used the toe brakes on the rudder pedals as you do on other aircraft because the double hand levers on the Viscount Control wheel were so practical and convenient to use. Our Viscounts were fitted with the very earliest of aircraft “anti-skid” braking systems in the world. The system was fitted by our own engineers and was later superseded by a Dunlop designed system under the trade name Maxaret.

The fact that the Viscount was designed in England in the early 1950s meant there were some mechanical systems which lacked performance when compared with the equipment supplied on American designed planes. Two important deficiencies were the Landing lights and windscreen wipers. The wing mounted landing lights originally fitted were almost non-effective. The intensity and range was abysmal when compared to the landing lights in the American Convairs. The solution was to fit Convair type lights to all Viscounts. This was a great improvement.

The design of the original windscreen wiper system included an electric motor driving a small hydraulic pump, which in turn drove the wiper blades back and forth. The weakness was in the closed hydraulic system. The wipers would occasionally almost cease working due to air in the oil lines. I have flown approaches with the wiper just moving rapidly across 75 mm of the screen. Our vision through the windscreen was always restricted by the metal structure so if the windscreen was streaming water it was most difficult to see. The TAA modification was to remove the English electric-hydraulic system and install Convair hydraulic wiper motors and matching blades, another positive improvement.

One morning we operated a charter flight to take Navy personnel from Melbourne to the naval base at Nowra. On arrival the passenger stairs were pushed to the rear door and a Chief Petty Officer stationed himself at the top of the steps and required every passenger to show their leave pass before leaving the aircraft. I felt that his heavy handed procedure conflicted with our desire to look after our passengers.

Another interesting day's work was a departure from Melbourne about 7am direct to Brisbane. From here we continued to Darwin via Mt Isa. In the summer the Queensland inland temperatures are usually very high. The Viscount air conditioning only works when the engines are running so during the Mt Isa stop, with the engines off, the cabin became unbearable. On completion of the refuelling and doing the fuel drain and external inspection my body temp was also rather high. After takeoff it was a relief to feel the cold forced draught flowing through the aircraft, but some of this cold air also came out through the overhead air vents in the cabin. As this cold air met the moist warmer air in the cabin a fog like vapour streamed down form the air vents. This vapour was often mistaken for smoke.

After refuelling every wing tank had to be checked in case water had entered with the fuel. To do this we used a fitting on an aluminium tube which was pressed into valves in the bottom of the wing tanks, the fluid in a glass bottle enabled us to see any water contamination. The test sample of kerosene flowed down into the jar but some of this fuel missed the tube and usually

tracked down your arm into the long sleeves of our white uniform shirts. The cotton absorbed the kerosene. At all Northern ports, where there were no Ground engineers, you returned to the cockpit sweaty and smelling of kerosene.

Occasionally when doing this water check in Darwin I have seen a milky liquid in the jar instead of the clear kerosene I expected. Normally we would reject this fuel but investigation by the Company had proven that this is normal in tropical conditions. Kerosene is hydroscopic, it absorbs water when warm. The moisture becomes visible when this warm humid fuel is pumped from the underground tanks into the aircraft and mixes with the colder fuel. Turbine engines are not affected by small amounts of water like piston powered engines so we were ok.

When compared to the European airports many runways used by TAA within Australia in the 1950s were rather soft and low in surface strength. To counter this, the Dunlop Tyre Company developed an alternative wheel for the Viscount which was wider and used a low pressure tyre. This tyre improved ground handling, particularly at those airports located in the Centre and north of our continent which experienced very high runway surface temperatures.

As Australia has ideal flying weather the year round, no snow or ice, our aircraft accumulated flying hours faster than any Airline overseas. Our Viscounts were flying an average of 9 hours every day and very soon they had accumulated sufficient landings to require a mandatory change of their primary wing spars.

To change these wing spars each aircraft was accepted by the TAA Overhaul Division. To commence this change a large wooden cradle was built below the fuselage to hold the wings and body steady. The aluminium sheeting on the upper surface of the wing is peeled back and the T shaped spars, which are the backbone of the wings, are disconnected from the body and new ones fitted. After rebuilding and extensive checks the aircraft was handed to the test pilots to check if this work had induced any change in the aircrafts flight characteristics.

In 1957 Captain “Jimmy” James requested that I be attached to the Test and Performance division as their “in-house” First Officer. The two test pilots

Captains Boyd and James intended testing every Viscount fitted with new spars using the full factory acceptance programme to compare the new results with those produced in England at the time. The test pilots knew my background as an engineer in the TAA overhaul hanger and thought I could contribute continuity and assist them in this task. Normally when an aircraft test was scheduled they requested rostering to allocate a First Officer for that flight so there was a crew change for every test flight. For the test pilots, having a different F/O for every flight was time consuming and interfered with their programs.

On the test flight of the first modified Viscount, Capt. Pat Boyd refused to allow any observers on board. Only he and I were on this particular flight. I later realised why he had made this firm decision. As we accelerated along the runway he was continually rolling the aileron wheel left and right. I realised that he was concerned that any change in the dihedral, that is the up sweep of the wings, could jam the metal control rods of the ailerons. These rods passed through holes in the wing ribs. Fortunately this did not occur. The first flight was quite normal.

Days of flight testing followed while we checked all stability aspects and compared our results to the originals and checked the stability performance up to the aircrafts maximum takeoff weight.

These wing spars not only carried the weight of the aircraft but also had holes drilled in them to attach the engines and the undercarriage. After drilling, to maintain the strength of the spar small tubular steel inserts were pressed into the holes in the alloy beam,

An Ansett Viscount crashed in 1968. When the aircraft was at 7500 ft. and 27 nautical miles from Port Hedland in WA a wing spar broke, at the outer wing, just inboard of number 4 engine. The cause was determined, by the Department, as a fatigue failure initiated during the previous spar change by an unknown engineer who pressed a damaged steel bush into a new spar. A burr on the side of the bush had cut a scratch line through the spar metal and from this point damage stress cracks slowly radiated within the spar which finally broke in flight.

Another type 700 broke up in a severe thunder storm in the vicinity of the Sydney airport. This structural failure was possibly due to over control. A third crashed in Queensland. Oil loss within an engine component led to an engine fire and heat ruptured the wing in flight.

In 1958 while working with the test division, Captain Pat Boyd directed me to participate in a research programme. In the interior of the Rolls Dart engines there are discs of spinning turbine blades. Some of these blades, of Nimonic 90 steel alloy, are subjected to extreme temperature as they are just downstream of the combustion chambers and were spinning at very high revs. The combination of heated steel and the fast spinning was causing a condition within the engine called “creep”, this is the tendency for the blades, when heated, to grow in length and create a danger of rubbing on the inside of the engine casing.

Vickers, Rolls Royce and TAA discussed this problem and decided they needed accurate aircraft performance data before making any deliberations. They decided to measure aircraft performance in flight with different engine speeds and jet pipe temperatures. To achieve this data Capt. Boyd placed me back on the normal roster and required me to carry a large master tachometer to collect performance figures on every flight. To carry out these tests I had to seek permission of the Captain of the flight to set up a designated power combination during cruise and collect the aircraft speed data. Although I explained the reasons for these tests some Captains were very cautious of any interference of their aircraft by a junior F/O. All the results were returned to the TAA performance engineers to assist their research.

July 1958 was a landmark. VH-TVM was delivered from Vickers with our first airborne weather radar. Initially there was only one set which was installed on the Captains left, difficult to see from the right hand seat. The presentation was not in multi-colour presentation we now use but only varying shades of gold. It took the crews a lot of practice in flight to interpret the rain cells buried among the lighted clutter. These days the different colours green, yellow and red show the varying intensity. This was a big step forward to improve aviation safety.

I will include some comments on the “galley” fitted to the Viscounts. It was located in the front of the cabin and had electric heater pads fitted for both food containers and beverage. The tea and coffee containers came on board already filled and were secured in place on hot plates. Between flights these containers were refilled in the catering kitchen and occasionally, due to work load and the shaped lip at the top of these containers, they were not completely emptied so new tea may be added to a residue of coffee. In-flight when drinking from our cups it was difficult to tell any difference, is it tea or coffee?

On long flights such as Adelaide –Perth the capacity of the kitchen stowage was stretched. We often found that surplus space below the radio rack, just behind the Captain, was utilised by catering to carry the cheese and biscuits. As time passed this cheese would get warm and release a very strong odour. We often wondered if it was the same block of cheese we had been carrying to and from Perth for years.

Passenger numbers continued to increase and TAA needed more aircraft. Capital Airlines in USA were selling some of their Viscounts so TAA bought one and also procured TVR from Cuba. The cockpit layout of these two aircraft was different. They were built by Vickers to a specification desired by Capital. They were very American and differed dramatically to the English standards. Many switch actions and warning lights were different. In fact the electrical switches were all down for ON. This is the reverse to the British aircraft standard. It was decided that only a limited number of TAA pilots would be converted to these “strangers”

Next came the 2nd generation of Viscount. Designated type 800 series and delivered in 1959. They were heavier, more powerful and the cabin was fitted to impress the passengers. Unfortunately the rear baggage locker area had been redesigned as an occasional lounge for passengers, far too small to be of any benefit but it drastically reduced the ability to carry all the passengers’ baggage. This created a different task for the DC3 fleet. A freighter was required to follow in the wake of these 800s loaded with the baggage and

freight which could not be carried on the 800. When the DC3 arrived at destination with the passenger bags these were then delivered by taxi to the home of the passenger. Eventually this lounge at the back of the aircraft was removed and the area converted to carry baggage.

Viscounts operated as the primary aircraft of the TAA system from 1954 until they were replaced on the premier routes by Lockheed Electras in 1959.

Many years later a friend returned from a work project in South America. One sector was flown in a Viscount and when fastening the seat belt, he was surprised to see the TAA name embossed on the back of his metal belt buckle.