TWIN, SET AND MATCH

DIAMOND DA42

BACK IN THE HALCYON DAYS OF GENERAL AVIATION, THERE WERE AT LEAST 20 PISTON TWINS ON THE MARKET. BUT TODAY, THERE ARE JUST A HANDFUL, PLUS ONE THAT AT THE TIME OF WRITING, WAS DUE TO BE RELEASED IN RUSSIA. AVIATOR TAKES A CLOSER LOOK AT THE COLLECTION AND INVESTIGATES WHAT ADDING A TURBINE TO THE TWIN PACKAGE CAN ACHIEVE.

> 66 Engines don't fail often but over that dark frigid water once would be enough if you only had one

Piper remains the benchmark in multi-engine piston aircraft production with the indomitable pair of the Seminole and Seneca V still a force to be reckoned with; while Diamond Aircraft of Austria (DA42-VI) and Italian manufacturers Vulcanair (P68) and Tecnam (P2006T) provide a dash of European flair as alternatives to the traditional American options. Russia's Avia, with its Avia 201, is the latest entrant to a market that has proved to be a major nut to crack in recent years.

So why has the popularity of the twin diminished? According to renowned aviation journalist J. "Mac" Maclellan, the rise of the piston single is responsible for the near demise of the piston twin. All types of piston airplane production have faded over the last 30 years but the piston twin has nearly vanished," wrote Mac recently. "On the used market piston twin values have plunged. Many blame cost and safety concerns for the piston twin decline. But cost and safety concerns are nothing new. The twin has always cost more to fly, and there were always the higher demands on the pilot if an engine failed. What has changed is that the single can now offer nearly all of the capability that was once exclusive to the twin.

"What's left exclusively for the twin is the capability to continue to fly under most conditions after one engine quits. So why do I still fly a twin? Well, because I own it and have for 23 years. It's worth more to me than anybody shopping for used airplanes. And Lake Michigan is about one mile from my home airport. Engines don't fail often, but over that dark frigid water once would be enough if you only had one."

Despite Mac's thoughts, twin-engine planes will continue to play a significant role in the foreseeable future, especially in the flight training sector. After all, airlines and other commercial ops that utilise multi-engine types need pilots who are endorsed to fly such complicated machinery. Additionally, multis such as the state-of-the-art Diamonds and Baron provide the power redundancy sought by many pilots who for whatever reason (usually financial) are unable to take the step up to the turbine ranks. Yes, there will probably always be a market for anything that improves the margin of safety and can help train the next generation of airline captains. To prove this point, Aviator decided to take a look at the magnificent seven, and, as a bonus, the indomitable Twin Otter, a rugged turboprop that continues to amaze.

DIAMOND DA42

BEECH G58 BARON

Beech Twins have always been a cut above the rest, and when it comes to the piston variety, the Baron is considered to be flying "Royalty". Yes, its genealogy and basic airframe configuration harks back more than 50 years, but you'd never know it when looking at the latest model.

The G58 is basically a G36 Bonanza fuselage with four feet more wingspan and a pair of the same 300 hp Continental engines used on the Bonanza. Performance is impressive, with climb at 1,750 fpm and cruise around 200 knots TAS. The plane's remarkable power also translates to more safety, allowing almost twice the single engine climb of its nearest competitor–a best-in-class 390 feet per minute.

The Baron's Continental IO-550 engines are approved for lean-of-peak operation, and typical burn is only 32 gallons (121 litres) per hour, so endurance at max cruise is 5.5 hours plus reserve. Like everything else about this plane, very impressive.

The Baron G58 is more than just a stylish aircraft, it also features new high performance Hartzell Scimitar propellers equipped with unfeathering accumulators as standard equipment, not to mention aesthetics and aerodynamics the envy of many.

NSW-based property investor and farmer Malcolm McLaurin last year bought a Baron after owning two Bonanzas; it simply seemed like a natural progression.

"I primarily use my Baron for inspecting property across regional NSW," Malcolm tells Aviator. "Its twin engine power, impressive range and great fuel efficiency makes it perfect for these types of missions.

"The aircraft is very comfortable to fly in and its avionics are great. I am particularly impressed with the weather radar as it provides a very clear picture of what's ahead of us. In IFR situations I take another pilot with me and get right above the weather. With such effective avionics our missions are rarely interrupted by weather."

Malcolm has a strip and hangar on his farm in Cowra and hangar space at Bankstown Airport. The Baron allows him to take off from either location to inspect property anywhere in NSW with five passengers on board in just two to three hours. "I don't even need to refuel," he says. "I can fly from Bankstown to Inverell and back in about three hours and on one tank of fuel. Essentially, from our hangar space at Bankstown, I can be anywhere in NSW within a couple of hours."


TECNAM SPECIAL MISSION TWIN

DIAMOND DA42-VI (AND THE NEW DA62 ON ITS WAY)

If you're thinking the VI is the DA-42 NG in disguise, think again. The latest DA42-VI version is a very different machine from the original. Aesthetically, it looks similar to the first of its type, but the series VI incorporates several improvements that transform the aeroplane.

It has become something of a cliché to label aircraft that look similar to previous models as "new" and "innovative" when they really aren't, but the DA42-VI introduces enough improvements to deserve the superlatives. Built out of lightweight strong glass and carbon fiber and powered by two Austro Engine top-of-the-line 168 hp AE300 turbo diesel engines, the VI provides even better performance and comfort than its predecessor.

Well-designed with new accents such as improved surface, revised cowling and nacelles and a new propeller, this aircraft generally exceeds expectations.

Equipped with jet fuel engines, the VI offers extreme fuel efficiency (consumption at 60% 10.4 US gallons/ 39 litres per hour), flies further (range at 60% 1,200 nm), is fuelled with lower-priced Jet-A1 and has lower maintenance expenses than conventional gasoline engines.

With traditional twins, single-engine operations were their Achilles heel. However, feathering an engine in the ultra-modern DA42-VI is as easy as flipping a switch, while restarting it after a simulated shut down is just as simple. With a single-engine ceiling of 18,000 feet and a positive rate of climb with one engine inoperative, it's obvious the aircraft's performance is supreme.

According to new DA42-VI owner Brian Meese, "The DA42-VI is wonderful. She does everything as promised. TAS 175-180 with a fuel burn of 13 gallons per hour (49 litres per hour) total at altitude. Climbs like a rocket through the ice layer, 1,350 feet per minute and still 1,100-1,200 at altitude. Radar is great. Use it a lot. Data link is great. Weather and sending emails and SMS at altitude. I don't think there is any other piston twin that comes close price/performance-wise. For those of us who don't want to spend what it takes to fly a turboprop, the DA42VI is the perfect airplane. What a dream machine!"

Diamond's new DA62 is the company's newest twin engine aircraft, designed to give enormous freedom of movement. The large cabin is comparable in size to a Mini Van, maximising space to offer room for up to five passengers. The huge rear and front baggage compartments are able to carry plenty of bags designed to offer passengers comfortable seating. A compelling mix of distinctive styling, consistent lightweight carbon design and superior flying dynamics is, ultimately, what the DA62 is intent on delivering.

PIPER SEMINOLE

Introduced in 1979, the Seminole became an instant hit with flight schools because of its low operating cost, tough, student-resistant structure and Piper's extensive

> 66 unlike other aircraft, avoids having to jump onto the wings

TECNAM P2006T

> Italians love to live life with a certain degree of flair and panache

support network. Cruise speed is 160 knots-plus and climb with both engines turning is 1,300 fpm. Piper isn't liable to sell many Seminoles to owner-pilots, a fact the company accepts, but it's a safe bet the aeroplane will continue to be popular in multi-engine flight training.

PIPER SENECA V

The Seneca V is arguably the most versatile twin in the sky. The result of over 40 years of evolution, the current Seneca V uses a pair of turbocharged, Continental TSIO-360 engines, developing 220 hp per side, plenty to propel the machine along at close to 200 knots cruise. The cabin retains the basic Saratoga configuration, with a cockpit entry door at forward right and a pair of cargo doors at aft left. The passenger enclosure is spacious and comfortable, and while it's capable of transporting six people in comfort, unless you're prepared to download fuel, don't plan to carry more than three plus baggage in the six seats.

TECNAM P2006T

Italians love to live life with a certain degree of flair and panache and Tecnam's P2006T Next-Generation VLT (Very Light Twin) does its best to live up to such lofty expectations. Bringing affordable multi-engine flying to aero-clubs, flying schools, syndicates and private aircraft owners, the four-seat P2006T has reportedly sparked significant interest among charter and air-taxi operators and as a platform for surveillance and observation for government agencies worldwide.

Tecnam have also just set up a new and dedicated 'Special Mission' department at its Capua, Italy facility, to direct the design, development and production of SMP aircraft and related features. The P2006T SMP (Special Missions Platform) aircraft offer the most cost effective and efficient flying platforms for surveillance, observation, aerial mapping or special mission tasks.

Many pre-orders are already in place for SMP equipped models - the basic SMP configuration has been developed to be the best platform to work for third parties sensor integration, giving STC capable companies the possibility to work exclusively only on sensors integration, on place airframes where modifications have already taken place e.g. different holes/apertures are available for all the above mentioned aircraft as well as mission powering system plugs (28V 40Amp capable).

Unbeatable value, low ownership, operating/maintenance costs (less than 0.3hr/flight hour) coupled with innovative design and combined with the Rotax '912S' engine ensures the Tecnam P2006T SMP affords high mission reliability and dispatch as well as lower noise emissions. With a high payload capacity the Tecnam P2006T SMP may be equipped with a wide range of payload and sensors. This is primarily due to the flexibility of its metallic construction and fully certified models, which allows modification(s) on the standard P2006T airframe.

Built to operate in challenging environments and semi-prepared strips, the Tecnam P2006T SMP benefits from extremely low take-off and landing runs (235 and 190mt respectively): the high wing keep the engines completely cleared from dust and any foreign object that could damage the propellers and the engine through the air intakes.

A spacious interior allows the installation of a comfortable working station and multiple screen desk: two separate doors, one for the pilot(s), the other one for the rear seat passengers or operator. The high wing ensures access to the cabin is straightforward and unlike other aircraft, avoids having to jump onto the wings!

The P2006T SMP's high wing and retractable landing gear also allow for a 'no view obstruction' for external cameras and operator FoV (Field of View). This potentially may make the difference between mission success and failure especially when auto-tracking a moving object from high altitude is performed.

For many missions and applications, such as search and rescue, reconnaissance, immigration surveillance/border patrol, drug trafficking and law enforcement missions, the Tecnam P2006T SMP is fully able to replace, support or drastically reduce the use of far more expensive/much complicated assets such as the deployment of CS/FAR 25 airplanes, helicopters and coast guard boats.

AVIA ACCORD 201

Information about the Russian-built Model 201 has been difficult to come by. In fact we're not even sure if the aircraft has received FAA certification. A high-wing twin with fixed tricycle gear and twin rudders, the aircraft was designed by Avia Ltd of Moscow, Russia as the Avia Accord 201. Produced at the Sokol plant at Nizhny Novgorod, the aircraft features rear clamshell doors that can be removed and has been modified with updated avionics.

Like many other Russian designs, the 201 is rugged and built to work hard from paved strips to grass or even water runways. We'll keep you posted on this one.

TECNAM P2006T CERTIFIED FOR PASSENGERS

> Excellent STOL capability enables it to land comfortably on short bush airstrips

So there you have it, a roundup of the piston twins currently doing the rounds in various roles for various operators all around the world. Piston singles may have caught up to their twin bretheren (some have even suggested they've surpassed them) but there will always be a place for piston twins in the forseeable future. Count on it.

Where the twin really comes into its own, is when the powerplant is switched to turbine – the aircraft becomes a reliable workhouse and, as countless operators will testify, is there a better utility aircraft than the Twin Otter. According to some who have flown the rugged "truck with wings", nothing beats it.

In 1965, de Havilland Canada developed the DHC-6 Twin Otter – a high-winged, unpressurised twin-engine turbine-powered aircraft with fixed tricycle landing gear. Designed as a rugged Short Take Off and Landing ("STOL") commuter, the Twin Otter was capable of carrying passengers and cargo into the most remote locations on the face of the earth. Customers operating in the harshest environments swore by the rugged utility, and as a testimony to its popularity, the aeroplane became the best-selling 19-passenger aircraft of all time.

In 23 years of production, de Havilland built a total of 844 Twin Otters but despite its success, the line was officially shut down in 1988. However, the "Legacy fleet", as it is now known, has remained in active use since the program ended, and continues to be used for every mission imaginable, especially in isolated third world countries where aircraft are critical to the transportation of passengers and cargo. This ability to reliably operate in any environment with minimal maintenance requirements has kept the legacy fleet at the forefront of niche markets around the world.

It is often said that the only thing that can replace a Twin Otter is another Twin Otter, which explains the high demand in the market to keep the nearly 600 remaining legacy aircraft in operation.

HONEYWELL PRIMUS APEX AVIONICS SUITE CERTIFIED ON VIKING TWIN OTTER SERIES 400

In 2005, Canada's Viking Air Limited purchased the Type Certificates for all of the out-of-production de Havilland aircraft (DHC-1 through DHC-7), including the Twin Otter. After extensive market analysis, Viking determined that an overwhelming demand existed to bring the Twin Otter back into production, thus the Viking Series 400 Twin Otter Production Program was announced in 2007.

The Series 400 Twin Otter picks up where the original de Havilland Series 300 Twin Otter left off, introducing upgraded Pratt & Whitney PT6A-34 engines, a

TWIN OTTER READY FOR WATER

TWIN OTTER SERIES 400

> the only thing that can replace a Twin Otter is another Twin Otter

fully integrated Honeywell Primus Apex digital avionics suite, use of composite materials, and approximately 800 other modifications incorporated to improve upon the original production model. However, like its predecessor, the Series 400 retains the ability to operate from remote and unimproved airfields due to its robust design, equalised maintenance program, and dependability of the Pratt & Whitney engines.

Mission Aviation Fellowship (MAF) is a Christian organisation that provides aviation services for people living in remote areas around the world. For over 60 years, MAF aircraft have been serving the isolated and underprivileged by providing a regular flight and freight service bringing the essentials of life into these communities as well as medical care, emergency food, and Christian hope.

MAF is also part of a dynamic worldwide partnership. Today worldwide, the partnership operates 142 aircraft from bases in over 30 countries, including the venerable Twin Otter.

"Our purpose is to deliver practical and spiritual care to people in places of deepest human need," a MAF spokesperson said. "Every three minutes, an MAF plane takes off or lands somewhere in the world. These flights enable crucial work by many aid and development agencies, missions, local churches and other national groups. MAF is serving the Church and communities in remote areas where flying is not a luxury, but a lifeline."

MAF utilises the legacy Twin Otter in Papua New Guinea. Flying with two pilots and carrying up to 20 passengers or 1,900kg of supplies, with a cruising speed of 180mph, the aircraft is ideal for MAF's operations in PNG. Rough and rugged terrain, deep valleys, rain forests and high mountain ranges make travel by road virtually impossible. With no real alternative means of travel, people are reliant on flying to enable them to reach other places but also for the transportation of their goods and supplies.

With the capacity to carry more, the Twin Otter is the ideal aircraft for the high volume of freight and passenger movement in PNG: the high-wing Twin Otter is also equipped with dual GPS navigations systems for safe and reliable flying.

Noted for its rugged construction, the Twin Otter is highly manoeuvrable and versatile and can be flown slowly and in tight circles. The enhanced reliability and performance of twin engines makes it ideal for the terrain in which it operates. Excellent STOL (short take off and landing) capability enables it to land comfortably on the short bush airstrips which are often scraped out of the sides of mountains or hidden away in deep valleys.

The large cargo doors ease loading of freight and the spacious interior enables bulky items such as building materials, engines and even livestock to be transported. Sacks of coffee, a valuable source of income for many communities, are transported to market to be sold, generating an income for many families.

Former MAF pilot Chris Bubb told Aviator that of all the aircraft he has flown, nothing comes close to the Twin Otter. "Of all the aircraft I have flown, I enjoy the Twin Otter the most," Chris said. "There's nothing glamourous about it, it's just a truck with wings. However, for the operations we do, where we need to move large loads - either people or freight - we need an excellent STOL aircraft with IFR capability. We need an aircraft with the added assurance that two engines give, plus plenty of power in reserve to climb up and over mountains that can be higher than 14,000 feet. In these conditions, there is nothing that comes close to the Twin Otter."

Chris adds that while the Canadian-built plane is well suited to doing large passenger loads such as students heading to school or church groups going to conferences, "it also excels in hauling large bulky loads such as building materials. We've had the cabin filled floor-to-ceiling with a radio mast and equipment to set up HF networks, including HF email so teachers at remote schools can communicate with other schools and their head offices. We've even delivered five tonnes worth of mosquito nets to a number of communities to help prevent Malaria; and medicine boxes filled with vaccines for health clinics."

Unlike the brand new Viking-made Twin Otter, the MAF's legacy aircraft are driven by 1960's technology but remain reliable and extremely versatile aeroplanes. Systems are simple, which is useful when operating out of bush airstrips and something goes wrong. The MAF Twin Otters have Garmin GPS nav units (very useful for IFR flying) and two Aspen avionics primary flight displays. And they still have the original analogue instruments fitted as backup.

> an overwhelming demand existed to bring the Twin Otter back into production

To date, Viking Air has sold Twin Otter Series 400 aircraft to military, commercial, corporate, and private operators in 27 countries around the world. The future promises to be exciting with continued aircraft deliveries, increasing the worldwide fleet of owners and operators who contribute to the ongoing de Havilland legacy every day. The Twin Otter is indeed a remarkable aircraft, one that is revered by those who value simplicity, reliability and versatility. Viking's version of the "flying truck" is simply the rebirth of a superb workhorse that was almost lost forever. ✱