GLOBAL
# Aviator
July 2016 / Vol. 8 / No. 7
Global Aviator for: All certified and uncertified aircraft, training, Airlines, Charter and General Aviation
SA R35

## HALO Aviation inaugurates 24 hour HEMS

www.magzter.com (on-line)
www.globalaviator.co.za
www.globalmilitary.co.za

# OUR INSTRUCTORS
## MAKE ALL THE DIFFERENCE

Customers come to FlightSafety for our advanced-technology training systems; our efficient, effective learning environment; our global Learning Center network; and our unrivaled Customer support. They keep coming back, time after time, for our knowledgeable, experienced instructors. They are, simply, the best in the business. Our instructors are dedicated to earning your trust by providing the highest quality professional aviation training available today.

### BENEFIT FROM THE INDUSTRY'S BEST INSTRUCTORS

- Type-Rated in the Aircraft Featured in the Training
- Highly Experienced Pilots, Averaging 10 Years on the Job
- Skilled Maintenance Technicians
- Accomplished Cabin Professionals
- Experts in Scheduling and Dispatch

**CONTINUE – AND ELEVATE – YOUR CAREER** Experienced pilots looking for their next rewarding career can continue to enhance aviation safety with the worldwide training leader. Land in one of the best places to work in aviation. Go to Flightsafety.com/careers to review current openings.

CELEBRATING SIXTY-FIVE YEARS 65 1951-2016

Aviation professionals from around the world trust us to provide the highest quality training and outstanding service. More than 1,800 highly experienced professional instructors deliver aircraft- and mission-specific courses, using our comprehensive training systems and advanced-technology flight simulators designed to enhance safety. Trust your training to FlightSafety. You'll see why so many aviation professionals make the same choice. And have since 1951.

**For more information, please contact Steve Gross, Senior Vice President, Commercial**
**314.785.7815 · sales@flightsafety.com · flightsafety.com · A Berkshire Hathaway company**

FlightSafety international

GLOBAL Aviator

PO Box 72416, Parkview, 2122
No 7 Las Palomas, 55 Lyncon Road, Carswald,
Midrand, 1684 South Africa
Tel: 011 701 5050 Fax: 086 515 2154 - www.globalaviator.co.za

**Publisher:** Mike de Villiers - 082 466 7757
mike@globalaviator.co.za

**Web design:** Cesaré de Villiers - 084 088 0700
cesare@globalaviator.co.za

**Accounts:** Tessa de Villiers (082) 824 7548
tessa@globalaviator.co.za

**Travel Editor:** Charmaine de Villiers- Cell: 082 551 4377
charmaine@globalaviator.co.za

**Contributors:** Owen Zupp (AUS), Charmaine de Villiers (SA), Cesaré de Villiers (SA), Mike Wright (SA), Dr Guy Gratton (UK), Skaiste Knyzaite (UK), Richard Browne (SA), Erik Brouwer (Netherlands), David Hook (USA), Davide Daverio

**Advertising:**

Chris Theodosi **Sales Manager:** +27 72 7991879
chris@globalaviator.co.za

Kagiso Mathane **Senior Sales Executive** +27 76 832 2001
kagiso@globalaviator.co.za

**Distribution** e-mail/internet/Magzter.com/CNA/Spar/Subs

**Editorial Enquiries** mike@globalaviator.co.za

**Subscription Enquiries** mike@globalaviator.co.za
Cell: 082 466 7757

**Published** Monthly on the last day of the month

**Distribution** Worldwide to 91 countries and over 15 million readers on-line and via e-mail.

**Banking:** Global Aviator
First National Bank,
Parktown - 250455
Account number - 62108220584





# *Travel Editor's note*

After just two weeks fighting the raging fires sweeping through the Canadian province of Alberta and having left South Africa amidst much fanfare, the 301 firefighters are back home.

June is regarded by many as 'strike month' and it seems this spread to Canada as the men and women had gone on strike over a pay dispute just days after touching down in Alberta to help Canadians battle wildfires.

There is the normal 'he said she said' scenario with each party blaming the other for the problems. The Minister of Environmental Affairs has said the workers were 'exploited'. The Alberta provincial government agreed to pay Canadian $170 a day per firefighter – news reports from SA apparently claimed they were paid between $15 to $21 an hour – quite a difference! The Minister reported says they were paid CAD$50 for a 12 hour day plus their SA wages. The truth of course will probably never be fully disclosed as is normal.

The Working on Fire is a government programme primarily implemented by Kishigu Holdings. The profit made by Kishigu is not clear!

The Inkwazi saga continues with continual reports that a new presidential plane would be purchases with a figure of R4 billion being bandied around. One of the reasons given for the replacement is that the current aircraft is unreliable thanks to technical problems. Surely the question of proper maintenance should be raised as the business jet is hardly near its 'sell by' date as it should fly for around 30 years. Other than government trips Inkwazi is apparently used each Friday to ferry the president to Durban with a helicopter then being used to transport him to Nkandla.

Incidentally, the cost for the new Air Force One is said to be US$290 million!

## Ethiopian Airlines celebrates 70 years

An African airline success story, Ethiopian Airlines celebrated 70 years of flying during April. Ethiopia's national carrier is currently Africa's leading commercial airline.

The occasion was celebrated in Sandton in June where future plans for the airline were also announced.

Besides Addis Ababa the airline has two other hubs in Malawi and Togo that enable it to serve destinations in the whole of Africa.

Ethiopian commands the largest share of the pan-African passenger and cargo network to 92 international destinations across five continents, operating the youngest and most modern fleet that includes ultra-modern and environmentally friendly aircraft such as the Boeing 787, Boeing 777-300ER, Boeing 777-200LR, Boeing 777-200 Freighter and Bombardier Q-400 double cabin. Although a long time Boeing client, Ethiopian Airlines has now also placed an order for 14 Airbus A350-900s. Over the past ten years the airline's turnover has increased by 500 per cent.

The airline was established by the US airline company Trans World Airlines and the Ethiopian government as a joint venture. It made its first commercial flight with a Douglas Sky Train on 8th April 1946 to Cairo from Addis Ababa.

In 1957 the first flight be an Ethiopian Aircraft commander was made, and in the same year it flew its first European route to Frankfurt, Germany. In 1973 Ethiopian Airlines flew it first flight to East Asia, flying to Shanghai in China. In 1988 the first flight was made to North America to Washington DC, USA and in 2013 it flew its first flight to South America to Sao Paulo, Brazil.

Ethiopian is currently implementing a 15-year strategic plan called Vision 2025 with the aim of becoming the leading aviation group in Africa with seven business centres: Ethiopian Domestic and Regional Airline; Ethiopian International Passenger Airline; Ethiopian Cargo; Ethiopian MRO; Ethiopian Aviation Academy; Ethiopian In-flight Catering Services; and Ethiopian Ground Service. Ethiopian has registered an average growth of 25% in the past seven years and received a number of awards.

Ethiopian Airlines recently marked its 70th anniversary and announced that it will commence scheduled thrice weekly flights to New York-Newark from Addis Ababa on 3 July 2016. Ethiopian will be operating the Boeing 787 Dreamliner on this route. New York-Newark becomes the airline's 93rd international gateway and fourth gateway in North America. Ethiopian currently operates daily nonstop flights from Washington DC to Addis Ababa, as well as three weekly nonstop flights from Toronto to Addis Ababa and three weekly flights from Los Angeles to Addis Ababa via Dublin.

Further destinations envisaged for 2016 include four Asian cities: Chengdu, Ho Chi Minh, Jakarta and Singapore. •

*Charmaine de Villiers*

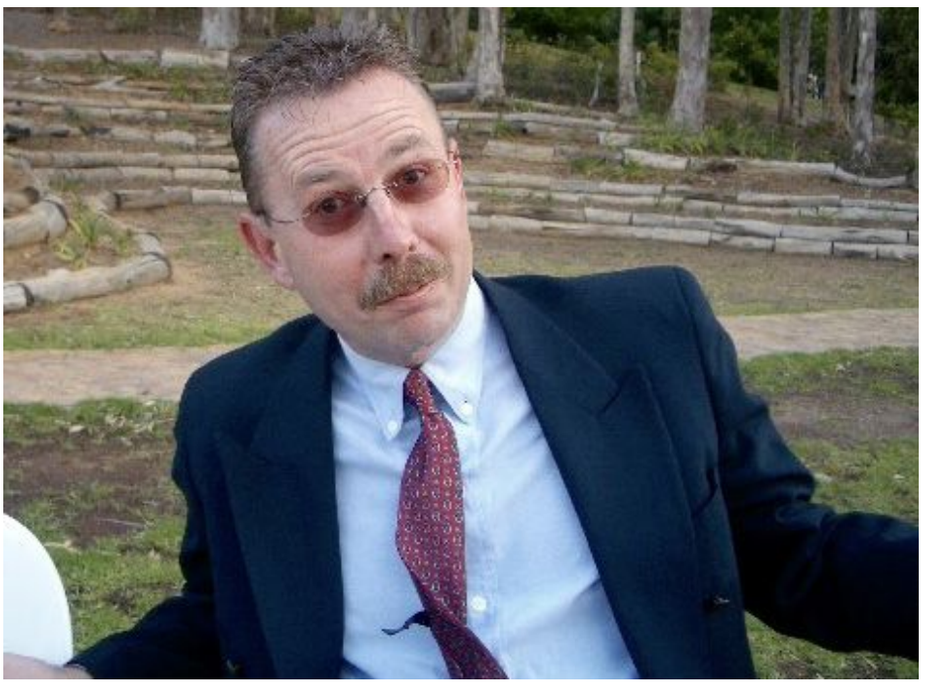
# An Airman Lost

**This is one narrative that I'd hoped not to write, well not so soon anyway. As one ages the possibilities of penning obituaries become all the more probable whilst the invites to 21sts and weddings fade.**

He was a good man, a cliché of the highest order, but broken into its parts, the meaning is all the more powerful. He was a man's man, he is now in the past and he embodied all that Oxford describes as good.

I met him first way back in my flying ambitions, it was not even a career then, just a start of something I'd always wanted to do. This gentleman guided me with some sage advice and in a manner so sincere especially since we were both total strangers to one another.

He re-entered my life after a period of years when I moved to the Eastern Cape region and began a commuting lifestyle to my job overseas, much the same as he. We became closer and we'd share chats on myriad subjects, not just flying. Many breakfasts and coffees were consumed over differing aviation thoughts.



His interest in multi-crew resource assignments rubbed off on me and we shared ideas on what the best way forward would be for applying it to the private pilot's syllabus, alas it never went further than a trial simulator series but the substance was good and the pupils that stood the try-out were positive.

I purchased a small experimental aircraft and with his guidance we formulated a testing schedule for the proving flight stage. His input and knowledge were not only invaluable to the effort but free flowing and unselfish. I have experienced humans who have the expertise and information but do not impart it freely for the need to "stay ahead" of the pack. This man was not like that.

As the years rolled on, I watched his young son develop into a decent young lad, attending his father's high school and showing ambitions for flight. The path my friend had trod was so sure, his son had no qualm following it.

When he hit a small bump in the road of life, he was welcomed into our home from where he rebuilt and reformed stronger and with more resolve to do better and to give back. He met his new life partner and the journey to happiness was re-joined. He achieved this with aplomb, his tendency to contentment was an example to me – if only we could all be half of this, we'd be getting on a lot better.

His flying career progressed and he found himself on a longer range jet but never faltering to come back to the warm place he knew he was wanted and nurtured. I think now that he felt welcomed and loved in this new environ and this showed through in all he did outside of it. As this time and new era evolved so did my friend. He taught me about appropriate behaviour and how to bestow it. I found the knowledge he was conferring to be more mature and measured as time progressed.

When I attended his funeral some days back, I was not saddened by his demise, I made that decision to go there to be effervescent in the same manner he was. Sure I am unhappy the tragedy occurred, I'd not be human otherwise, but I am most grateful to have been afforded the time with such a personality and honouring that is more currency than a tear on a grave.

He was a giant in our community and a soft hearted gentleman at the core.

He was Keith Patterson.

*Richard Browne*

# A MULTI-SPECTRAL, HIGH-DEF, COMBINED VISION SYSTEM. IN A WORD, AMAZING.


For unsurpassed situational awareness, we present FalconEye. Available for the 8X, this remarkable breakthrough provides an extremely high-precision guidance system that ensures greater flight safety and operational capabilities. For a hi-fidelity look at the outside world even in the worst weather conditions and in the dead of night, it's FalconEye.

**Falcon 8X**

WWW.DASSAULTFALCON.COM | FRANCE: +33 1 47 11 88 68 | USA: +1 201 541 4600

DASSAULT FALCON ENGINEERED WITH PASSION

# Adrenaline Wonderboom Airshow 2016


*By Mike Wright - pics by Adrian Munro*

**Airlink, South Africa's leading regional feeder airline and title sponsor of this show , launched its new direct flights to Cape Town and back in partnership with South African Airways in 2015. They provide business and leisure travellers with a choice of two return scheduled flights per day. The single terminal at Wonderboom Airport provides passengers with a walk-on-walk off experience, a hotel within the airport, more than 184 businesses on its premises, convenient and affordable parking in close proximity to the terminal building, restaurants and business class lounge facilities, ensuring that every need of the traveller is taken care of.**

## Wonderboom Airport

The Wonderboom Airport celebrates its 80th year in existence this year having opened in 1937, being built on the farm Wonderboom approximately 15 km north of Pretoria. Originally a civilian airstrip for light aircraft, it was used for military training purposes during the WWII before returning to civilian control in 1945. The airport remains a light aircraft facility to this day.

In 1965, the airport was extensively extended, with a new terminal building and hangars being constructed as well as the runway being extended. This led to Wonderboom Airport being able to receive its first B737 in 1982. In 1993, the runway was again upgraded to its present length of 1,828 m.

Airport management passed to the Greater Pretoria Metro Council in December 1994. Towards the end of 2000, ownership passed to Pretoria.

In 2007, plans were mooted by the city of Pretoria for scheduled passenger service from Wonderboom Airport. The municipality spent R165.5 million in order to upgrade the airport in anticipation of passenger flights. In July 2009, it was announced that scheduled passenger service to Cape Town and Durban was due to commence in October 2009.

The airport can cope with 450 departing and 400 incoming passengers per hour. It is believed that there is a market for passenger service, mainly Pretoria residents that do not wish to commute to O R Tambo; an estimated 25%-30% of passengers using O.R. Tambo are Pretoria residents. Beginning 17 August 2015, Airlink started offering direct flights to Cape Town from the airport.

## THE AIRSHOW

The Wonderboom Adrenaline Airshow transformed the airport into a venue with huge activity and something for everyone young and old.

Part of Wonderboom Airport's 80th birthday celebrations and organised by Christiaan Majorana of Wonderboom's landmark Villa San Giovannis's restaurant and Air teams Chris Briers in partnership with the City of Tshwane and the tenants of Wonderboom airport, the Airlink Wonderboom Adrenaline Airshow combined aviation and motorsport speed, excitement and noise never seen before in South Africa. The 4km race track and a 1000 meter drag race strip which had been set up gave those that flocked to the airport a unique


*Above:* ***Airlink's formation. On the left the RJ-85 and right the ERJ-135***

*Right:* ***The RV Raptor formation under Pierre Gouws***

combination of aviation and motorsport.

The crowd was treated to aerobatics and aeroplanes, muscle cars, hot rods, amazing motorbikes, live music, great food and refreshments as well as a kid's entertainment park that kept the little ones busy.

The event commenced with a youth aviation careers day on the Friday and 8,000 plus pupils filled the grand stands. They had been invited by the Airlink Adrenaline Wonderboom Airshow to come and experience the many career options available to them in aviation and motorsport.

First up on Saturday was a colourful para drop from the PAC 750 XSTOL. Next we had Menno Parsons in Mustang Sally. The Absolute Aviation Extra 300, a second one and Nigel Hopkins in his new Extra 330 LC and he raced a Porsche – great!

Great to have were the 2 L29s and the Impala.

Airlink really came to the party with displays by its aircraft being the RJ 85 and ERJ 135 which even flew in formation which was hugely appreciated by the crowd. The students were invited on board the RJ 85 in Friday as part of the careers day.

- Goodyear aerobatics Pitts Specials were put through their paces.
- Pilatus Glider – Gary Whitecross really did well with this beautiful machine.
- Team Torre excelled in the 4 Pitts Specials as did the Harvards including a stunning sunset flight. Team leader Scully Levin also brought back his most appreciated stunt of landing his Piper J 3 on the back of a moving bakkie driven by his son Ellis.
- Bell 407 / bike race provided a lot of excitement.
- Neville Ferreira was at his very best in the locally built Slick 540
- The Vans RV Raptor of the Goodyear Pitts Team formation again excelled under Captain Pierre Gouws as did the L39 and Impala. Also no less than two Trojan TH 28 es made their thundering appearances.

## Non aviation activities on the days day included:

- Super bikes
- Bike tricks
- Drifting displays
- A Jet car
- On the Sunday a Dragster race
- Jet car
- Nissan GTR
- Wesbank Saloon and hot rod championships

Well done to the teams for organizing and flying, Brian Emmenis of Capital Sounds, Mark Mansfield for the Media arrangements and to all sponsors on the day. •

*Menno Parsons in his Master Power Technologies Bell 407 locked in combatwith fast cars*

*Menno Parsons in the Bell 407*

*Nigel Hopkins in his Extra 330 LC thrilled the croud*

*Torre Aorbatic team - Scully and Ellis Levin, Sean Thackwray and Arnie Meneghelli*


*Goodyear Eagles team under Glen Warden*

*Scully and Arnie - Torre Pitts Specials During their sequence.*


*Airlinks RJ-85 approaches for landing with speed brake extended*

# Boeing leads Airbus in terms of overall orders

**According to recent reports, Boeing is still the leader in overall orders for airliners, but its competitorAirbus is closing the gap. Airbus took orders for 83 aircraft in May, but remains behind Boeing for overall orders for the year. At the same time, Airbus narrowed the market share gap slightly by getting 38 percent of the net orders for airliners for the first five months of the calendar year.**

Among the orders for Airbus airplanes is one for 60 of its new engine option single-aisle airplanes from an undisclosed customer. The total number of net Airbus orders after adjusting for cancellations is 162.

Boeing's with 234 net orders has a more robust order book in the five-month period, according to the report. Airbus has targeted 650 deliveries this year and said last week that it is still confident it will meet both its order and delivery targets despite a slow start to the year for both the A350 and A320neo models. •

# Turkish Airlines

Turkish Airlines has commenced its new Service from Cape Town to Instabul via Durbans King Shaka International Airport using pts A330 300s. •

# Emirates Airline

The carrier will soon launch its 3rd daily frequency into Cape Town using B777 300 ERs which compliments the present 4 into Johannesburg and 1 into Durban daily. •

# CemAir

CEO Miles van der Molen recently ferried back a second user Dash 8 300 – a 50 seater which is going to be used in the Johannesburg - Margate and Margate - Plettenberg Bay and other routes. Meanwhile their other routes including Bloem - George are all doing well using their fleet of CRJs, Beech 1900 D and Dash 8 100 airliners. •

# Latest Airlink update with the CEO Rodger Foster

We asked the CEO just how important Wonderboom and the show which Airlink has just sponsored are to the Company

He says that Airlink is fully committed to the new route adventure in linking our capital cities of Pretoria and Cape Town via Wonderboom airport. The route is under development and as part of its objective of improving awareness about Wonderboom Airport and the air service on offer there, Airlink has joined the adrenaline show initiative to the extent of undertaking the host sponsorship with naming rights. The Airlink Adrenaline show offered exciting allure to Airlink's existing and prospective customers throughout the catchment and with a large attendandance of over 60,000 distributed over the two public show days and the learner career day, the show is a great opportunity to showcase to the public the airport and the scheduled flights to and from Cape Town.


The business class lounge at Wonderboom has been opened and offers seclusion and privacy in quiet comfort to our business class and voyager customers.

The road infrastructure, specifically the opening of the K97 on and off ramps to the Platinum highway, remains an issue. They are working with the Executive Mayor of the City of Tshwane to resolve the impediments to the opening of the already built infrastructure.

## New routes

The CEO says that new routes often take lengthy periods to develop with concomitant investment. "Most of Airlinks new routes have performed beyond expectation barring one or two, particularly in instances where we are in competition with certain neighboring State owned airlines that do not have sustainable viability and profit as an imperative. The new Cape Town - Maun route is doing exceptionally well and surprisingly has not impinged on the Johannesburg Maun performance".

## Fleet renewal

Airlink's fleet renewal study has been concluded and there is a definitive recommendation on its way to our Board. Airlink expects a resolution authorizing the implementation of its "life after Avro" initiative imminently. They anticipate the introduction into service of the succession type in Q1 2017 and expect the Avro fleet to be fully replaced by 2021.

## Weak Rand and recent decisions taken by Airlink to try and deal with it all:

The CEO feels that the weak Rand has presented additional challenges. Most of an airline's input costs are denominated in hard currency whilst most of our revenue is in Rands therefore it is tough to settle the Dollar and Euro bills. Fortunately for Airlink, most of their aircraft are in ZAR denominated ownership structures which has helped to keep its head above water. The weak Rand has encouraged tourism which has boosted its traffic volume, which is 8% up year on year. The low oil price has also helped, he said.

## General observations

The improved regulations are better for tourists.

The lodge link system is slowly developing. It will take a while but we are confident that it will be successful in time.

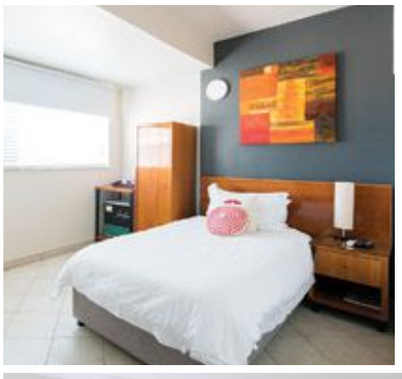
The CEO is pleased that Airlink was able to assist SA Express and Inati Ntshanga (SAX's chief executive) during the grounding period. The most important considerations were to assist SAX's customers to reach their destinations with minimal disruption, and to assist SAX in having the suspension order lifted at earliest opportunity.

The SA airline business is clearly tough at present the CEO says. The economy is challenging, and the market is overtraded. He feels that that there will be more rationalisation in due course as many markets cannot sustain the current levels of competition. Longhaul travel patterns are shifting from the Johannesburg collection point to direct nexus with emerging connection hubs in Middle East, North Africa and Turkey and the role of South Africa as a facilitator of air access throughout the sub region is fast changing – travelers from the world over are accessing key destinations within the SADC region via the Middle East, Addis Ababa or Istanbul. This radical shift requires a realignment of local supply. Importantly the Cape Town hub is enjoying sustained double digit growth in passenger volume where the Johannesburg hub is gradually losing out. •

# VILLA SAN GIOVANNI
AIRPORT ACCOMMODATION

**WONDERBOOM AIRPORT**



# *Airport Hotel*
## FOR THE DISCERNING TRAVELLER

TOURISM GRADING COUNCIL OF SOUTH AFRICA

Our newly revamped 4 Star Hotel features 11 en-suite bedrooms that have been carefully styled for comfort and relaxation; designed in keeping with modern day conveniences for the discerning business person or pilot. Guests can enjoy uninterrupted views of the runway by day and night from the rooms and can continue to do so by stepping down for breakfast on the terrace.

Wonderboom Airport, Main Terminal Building, Pretoria | 012 543 0501 | info@vsg.co.za | www.vsg.co.za

# Helios Airways Flight 522


**Helios Airways Flight 522 was a scheduled Helios Airways passenger flight that crashed into a mountain on 14 August 2005 at 12:04 pm EEST, north of Marathon and Varnavas, Greece, while flying from Larnaca, Cyprus, to Athens, Greece. Its final destination was to have been Prague Ruzyně International Airport. A lack of oxygen incapacitated the crew, leading to the aircraft's eventual crash after running out of fuel. Rescue teams located the wreckage near the community of Grammatiko, 40 km from Athens. All 115 passengers and six crew on board the aircraft were killed.**

With 121 fatalities, this was the deadliest aviation accident in Greek history. Flight 522's loss marked the 69th crash of a Boeing 737 since it was brought into service in 1968. The crash is the fourth-deadliest involving a 737-300.

The aircraft involved was first flown on 29 December 1997 and had been operated by DBA in 1998 until it was leased by Helios Airways on 16 April 2004 and nicknamed Olympia, with registration 5B-DBY. Aside from the downed aircraft, the Helios fleet consisted of two leased Boeing 737-800s and an Airbus A319-111 delivered on 14 May 2005. The aircraft had arrived in Larnaca from London Heathrow at 01:25 that morning. The flight was scheduled to leave Larnaca, Cyprus, at 09:00 am local time, and fly to Prague via Athens. The scheduled arrival time in Athens was 10:45 am. Hans-Jürgen Merten, a 58-year-old German contract pilot hired by Helios for the holiday flights, was the captain. He had been flying for 35 years (including for Interflug before 1990) and had accrued 16,900 flight hours. Pampos Charalambous, 51, a Cypriot who flew for Helios, served as the first officer and had worked exclusively for Helios for the last five years. Charalambous had accrued 7,549 flight hours throughout his career. Louisa Vouteri, a 32-year-old Greek national living in Cyprus, replaced a sick colleague as the chief purser.

Flight and crash - Date: 14 August 2005
Flight path of Helios 522-en.svg
All times EEST (UTC + 3h), PM in bold

| Time | Event |
|---|---|
| 0900 | Scheduled departure |
| 0907 | Departs Larnaca International Airport |
| 0912 | Cabin Altitude Warning sounds at 12,040 feet (3,670 m) |
| 0914 | Pilots report air conditioning problem |
| 0920 | Last contact with crew; Altitude is 28,900 feet (8,809 m) |
| 0923 | Now at 34,000 feet (10,400m); Probably on autopilot |
| 0937 | Enters Athens flight information region; Nicosia ATC informs Athens ATC that radio contact has been lost. |
| 1012–1050 | No response to radio calls from Athens ATC |
| 1045 | Scheduled arrival in Athens |
| 1054 | Athens Joint Rescue Coordination Center alerted to possible renegade aircraft |
| 1105 | Two F-16 fighters depart Nea Anchialos |
| 1124 | Located by F-16s over Aegean island of Kea |
| 1132 | Fighters see co-pilot slumped over, cabin oxygen deployed, no signs of terrorism |
| 1149 | Fighters see an individual in the |

***Above: The official accident investigation board was informed by Discovery Channel of the similarities with the G-DOCE incident.***

***Left: Artist rendering of Helios Airways Flight 522 being intercepted***

cockpit, apparently trying to regain control of aircraft

1150 Left (#1) engine stops operating, presumably due to fuel starvation

1154 CVR records two MAYDAY messages

1200 Right (#2) engine stops operating

1204 Aircraft crashes in mountains near Grammatiko, Greece

When the aircraft arrived from London Heathrow earlier that morning, the previous flight crew had reported a frozen door seal and abnormal noises coming from the right aft service door. They requested a full inspection of the door. The inspection was carried out by a ground engineer who then performed a pressurisation leak check. In order to carry out this check without requiring the aircraft's engines, the pressurisation system was set to 'manual'. However, the engineer failed to reset it to 'auto' on completion of the test. But once airborne, this omission was compounded when pilots forgot to check whether the system was switched on automatic or manual. As a result, the higher the plane flew the less oxygen was in the cabin.

After the aircraft was returned into service, the flight crew overlooked the pressurisation system state on three separate occasions: during the pre-flight procedure, the after-start check, and the after take-off check. During these checks, no one in the flight crew noticed the incorrect setting. The aircraft took off at 9:07 with the pressurisation system still set to "manual", and the aft outflow valve partially open.

Within 13 minutes, as the plane climbed, the air pressure slowly dropped. The effects of hypoxia (oxygen starvation) are insidious. The pilots' judgment became impaired without them realising it. Their radio calls to the ground made it clear that they had misunderstood the true nature of the warning horn that was blaring on the flight deck. The drop in temperature turned the plane into a "flying tomb" at 34,000 feet as passengers were frozen to their seats by temperatures of minus 50c.

There were only minutes to go before both pilots slipped into unconsciousness. In the main cabin, however, as the planeload of passengers settled down sleepily, the cabin crew suddenly had their first dramatic indication that something was wrong. What air crew call the "rubber jungle" - the forest of oxygen masks over the passengers' seating - sprang down automatically as the air pressure reached danger levels. Yet the plane carried on climbing, instead of carrying out an emergency descent. The cabin staff were unable to walk in to talk to the pilots. If they had, they would have been able to give them crucial information, and the captain would have been alerted to don his own oxygen mask.

Instead, both pilots were sealed behind their bullet-proof door, in the grip of a fatal misunderstanding. They thought their electronics were overheating. Neither ever put on an oxygen mask, according to investigators.

As the aircraft climbed, the pressure inside the cabin gradually decreased. As it passed through an altitude of 12,040 feet, the cabin altitude warning horn sounded. The warning should have prompted the crew to stop climbing, but it was misidentified by the crew as a take-off configuration warning, which signals that the aircraft is not ready for take-off, and can only sound on the ground.

In the next few minutes, several warning lights on the overhead panel in the cockpit illuminated. One or both of the equipment cooling warning lights came on to indicate low airflow through the cooling fans (a result of the decreased air density), accompanied by the master caution light. The passenger oxygen light illuminated when, at an altitude of approximately 18,000 feet, the oxygen masks in the passenger cabin automatically deployed.

Shortly after the cabin altitude warning sounded, the captain radioed the Helios operations center and reported "the take-off configuration warning on" and "cooling equipment normal and alternate off line". He then spoke to the ground engineer and repeatedly stated that the "cooling ventilation fan lights were off". The engineer (the one who had conducted the pressurisation leak check) asked "Can you confirm that the pressurisation panel is set to AUTO?" The captain, possibly experiencing the onset of the initial effects of hypoxia, disregarded the question and instead asked in reply, "Where are my equipment cooling circuit breakers?" This was the last communication with the aircraft.

The aircraft continued to climb until it levelled off at FL340, approximately 34,000 feet. Between 09:30 and 09:40, Nicosia ATC repeatedly attempted to contact the aircraft, without success. At 09:37, the aircraft passed from Cyprus Flight Information Region (FIR) into Athens FIR, without making contact with Athens ATC. Nineteen attempts to contact the aircraft between 10:12 and 10:50 also met with no response, and at 10:40 the aircraft entered the holding pattern for Athens Airport, at the KEA VHF omnidirectional range, still at FL340. It remained in the holding pattern, under control of the auto-pilot, for the next 70 minutes.

Two F-16 fighter aircraft from the Hellenic Air Force 111th Combat Wing were scrambled from Nea Anchialos Air Base to establish visual contact with the silent aircraft. They intercepted the passenger jet at 11:24 and observed that the first officer was slumped motionless at the controls and the captain's seat was empty. They also reported that oxygen masks were dangling in the passenger cabin.

At 11:49, flight attendant Andreas Prodromou entered the cockpit and sat down in the captain's seat, having remained conscious by using a portable oxygen supply. Prodromou held a UK Commercial Pilot License, but was not qualified to fly the Boeing 737. Crash investigators concluded that Prodromou's experience was insufficient for him to gain control of the aircraft under the circumstances. Prodromou waved at the F16s very briefly, but almost as soon as he entered the cockpit, the left engine flamed out due to fuel exhaustion, the plane left the holding pattern and started to descend. Ten minutes after the loss of power from the left engine, the right engine also flamed out, and

just before 12:04 the aircraft crashed into hills near Grammatiko. There were no survivors.

## Passengers

The aircraft was carrying 115 passengers and a crew of six. The passengers included 67 due to disembark at Athens, with the remainder continuing to Prague. The bodies of 118 people were recovered.

## Investigation

The flight data recorder and cockpit voice recorder were sent to Paris for analysis. It was the CVR recording that enabled investigators to identify Prodromou as the flight attendant who entered the cockpit in order to try to save the plane. He called 'Mayday' five times, but because the radio was still tuned to Larnaca, not Athens, he was not heard by ATC; his voice was recognized by colleagues who listened to the CVR recording.

The emergency oxygen supply in the passenger cabin of this model of Boeing 737 was provided by chemical generators that provide enough oxygen, through breathing masks, to sustain consciousness for about 12 minutes, normally sufficient for an emergency descent to 10,000 feet, where atmospheric pressure is sufficient to sustain life without supplemental oxygen. Cabin crew have access to portable oxygen sets with considerably longer duration.

***The Hellenic Air Accident Investigation and Aviation Safety Board (AAIASB) listed the direct causal chain of events that led to the accident as:***

- non-recognition by the pilots that the pressurisation system was set to "manual",
- non-identification by the crew of the true nature of the problem, incapacitation of the crew due to hypoxia, eventual fuel starvation, impact with the ground.

## Previous pressurisation problems

On 16 December 2004, during an earlier flight from Warsaw, the same aircraft experienced a rapid loss of cabin pressure and the crew made an emergency descent. The cabin crew reported to the captain that there had been a bang from the aft service door, and that there was a hand-sized hole in the door's seal. The Air Accident and Incident Investigation Board (AAIIB) of Cyprus could not conclusively determine the causes of the incident, but indicated two possibilities: an electrical malfunction causing the opening of the outflow valve, or the inadvertent opening of the aft service door.

Passengers reported problems with air conditioning on Helios flights and during the 10 weeks before the crash, the aircraft's Environmental Control System was repaired or inspected seven times.

News media widely reported that shortly before the crash a passenger sent a text message indicating that one of the flight crew had become blue in the face, or roughly translated as: "The pilot is dead. Farewell, my cousin, here we're frozen." Police later arrested Nektarios-Sotirios Voutas, who admitted that he had made up the story and given several interviews in order to get attention. He was tried by a court and received a suspended six-month imprisonment sentence under a 42-month probation term.

The company announced successful safety checks on their Boeing fleet on 29 August 2005 and put them back into service. It later renamed itself from "Helios Airways" to "αjet". Authorities in Cyprus detained the company's aircraft and froze the company's bank accounts, and the airline stopped operating on 11 June 2006.

In March 2011, the Federal Aviation Administration in the United States released an airworthiness directive requiring all Boeing 737 aircraft from −100 to −500 models to be fitted with two additional cockpit warning lights. These would indicate problems with take-off configuration or pressurisation. Aircraft on the United States civil register were required to have the additional lights by 14 March 2014.

In early 2008, an Athens prosecutor charged six former employees with manslaughter over the incident. On 23 December 2008, Helios Airways and four of its officials were charged in Cyprus with 119 counts of manslaughter and of causing death by recklessness/negligence. The case was dismissed, and the defendants acquitted, on 21 December 2011. The panel of judges hearing the case ruled that there was no "causal association between the defendants and the negligence they were charged with for the fatal accident.

In December 2011, shortly after the end of the case in Cyprus, a trial began in a Greek magistrate's court in which three officials and the chief engineer were charged with manslaughter. They were found guilty and sentenced to 10 years imprisonment and remained free on bail pending an appeal. They lost their appeal in 2013 and although their sentences stood they were given the option to buy out their sentence for around €75,000 each.

## The crash site today

The crash site is easily accessible by car and clearly signposted. A large cross and a church have been erected in memory of the victims. All wreckage of the aircraft (possibly with the exception of the odd very small item or piece) has been removed from the site.

Helios Airways Flight 522 was the subject of the Mayday and Air Crash Investigation episode "Ghost Plane".

## Can this have happened to Flight MH370?

The Boeing 777 ER Flight MH370 flying under Malaysian Airlines took off from Kuala Lumpur on March 8 at 12:41 am. It reached the altitude of 35,000 feet at 1:01 am. The last air-traffic control confirmed position was off the coast of the Malay Peninsula at 1:21 am. It then turned sharply, apparently heading back. From there the direction it took is not truly known but the plane seems to have flown for about 7 hours, thus exhausting all the fuel on board.

If Flight MH370 was airborne until engines flamed out due to lack of fuel, the case could bear striking resemblance to Flight 522.

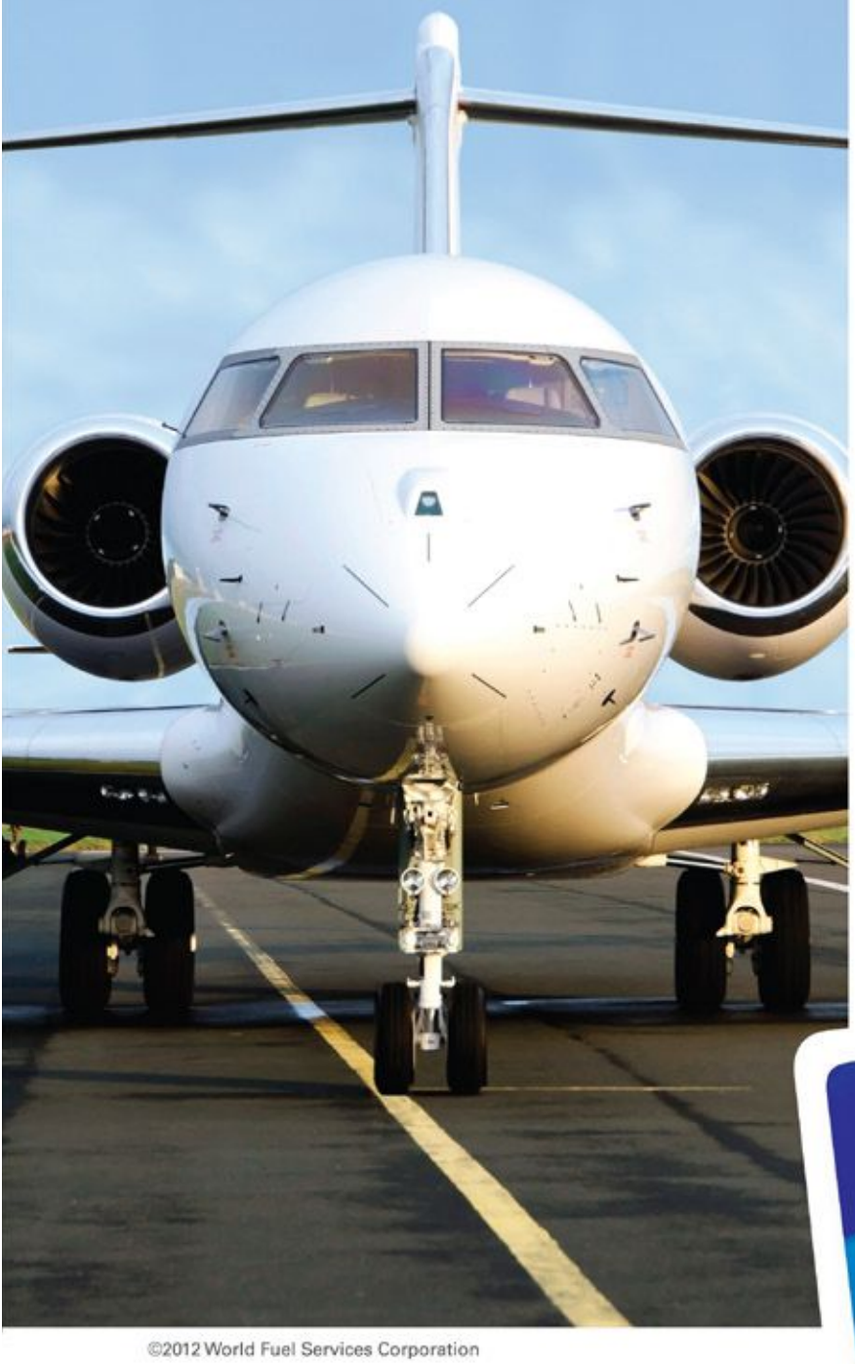
The apparent erratic conduct of flight MH370 and the disabling of some communication equipment could be explained either by impaired pilot judgment typical of hypoxia (oxygen starvation) triggered by a slow cabin decompression, or because of the intervention of someone on board with limited flight piloting experience who may have tried to replace the hypoxia incapacitated crew. The slow decompression could be due to an operational error, as was the case for Helios Flight 522, or because of structural failure. Following the discovery of a 40 cm crack on a B-777 on 6 March, just two days before Flight MH370's disappearance, the FAA issued an Airworthiness Directive requiring inspection of B-777 fuselages for cracks at an antenna location that they said could lead to decompression. •


*Map: Crash area of the flight in red*

MH AVIATION SERVICES

# Your Flight Support Partner in Africa

**MH Aviation Services is now part of World Fuel Services, one of the largest fuel brokers in the world, leveraging an extensive worldwide fuel and handling network.**



Based in Johannesburg, MH Aviation Services is your ideal partner for flight support services in Africa and the rest of the world.

- Competitive fuel prices, fuel solutions including bulk, into plane and fuel distribution.
- One bill for all services in ZAR, USD or EUR. VAT exemptions and fuel card payment solutions.
- Over-flight and landing permits, flight plans and weather briefings
- Ground handling, crew accommodation, travel, transport and catering arrangements.

**Contact us to make trip planning in Africa and around the world easier and more efficient.**

24/7 Flight Support: +27 82 940 5437
office: +27 11 609 0123
fax: +27 86 653 2746

flightsupport@mhaviation.co.za

www.mhaviation.co.za

By Kaypius

# Sleepless in Washington

**Procedures in airports and airlines have become so tiresome post 9/11 as to cause fatigue even before embarking on a flight. Suspicious eyes are cast on innocent passengers for trivial reasons like talking in loud voices or making gestures and even asking for an extra round of drinks in economy class. Some time before the Modi-Obama friendship blossomed in the South Lawn of White House, I was fortunate to escape from Uncle Sam's wrath after raising the bar (no pun intended) for airline etiquettes onboard a routine US Airways flight. Don't get me wrong, I was only high on a dreadful cocktail of fatigue and flying.**

The incident took place a few months post 9/11. Not the best of times to be flying in the United States. We were a bunch of trainee military test pilots and test engineers on a whirlwind tour of the US towards culmination of the flight test course. As test crew-to-be, we were still a little wet behind the ears, albeit every bit as precocious as Douglas Bader and Charles Lindbergh crossed!

Soon after landing in the US, we faced a packed schedule, jet-setting almost every day across the continent. The first two days and nights were especially hectic with back to back visits across the east coast. Most of the initial flights were booked on a regional carrier flying the small turboprop Bombardier Q400. Those of you who are familiar with this aircraft may have noted that in this aircraft, the undercarriage bay is under the engine nacelle and the wheels are visible from passenger cabin when lowered.

The initial excitement of an exciting foreign tour - a first for most of us, coupled with jet lag and disrupted circadian rhythm started taking its toll after the second day. The third evening, our team of a dozen sleepy souls was flying from Buffalo NY to Washington DC. Understandably, the national capital was guarded like a fort and any flight to or from DC was given a 'twiceover'. It was again the small regional airliner and I remember boarding the aircraft with a degree of familiarity having logged six flights in half as many days. A few civilian passengers, mostly senior citizens and business executives travelling to DC, made up the balance thirty five-odd seats. Pretzels and soft drink served soon after take-off settled us down for the short flight of just over an hour. Sleep continued to evade me.

Over Washington in an hour, the familiar landmarks of Capitol Hill, Washington Memorial etc. were now coming into view. Most of us were glued to our windows eager to get back to the comfort of our hotel rooms. I was following every manoeuvre of the aircraft and thought it was about time the wheels were lowered. My eyes were focussed below the engine nacelle, ears straining to hear the dull 'thud' of wheels locking down. Minutes passed as the plane winged over the Potomac to align with the runway on final approach. Down to about 1000 feet and descending, still no signs of the wheels coming down. Like all self-respecting pilots belted down in the passenger cabin of an aircraft, it was but natural to suspect the competence of the pilots in the cockpit.

The long hours of travel, sleep deprivation, jet lag and anxiety at the pilot's apparent callousness all churned together in my stomach and started welling up with rising intensity. Imagine a group of young test pilots being belly landed in the American capital. Surely, he can't be doing this to us! And yet, the aircraft continued descending on short finals regardless. We were seconds away from disaster!

With the mind staring at impending disaster, I reacted instinctively and screamed at the poor cabin attendant seated at the cockpit door facing us "tell the pilot to go around, he has not lowered the wheels!" Hearing me, three or four of my equally fatigued colleagues sitting by the windows also glanced out and started screaming in unison, some in chaste Punjabi (a language native to the northern Indian state of Punjab). The effect of four passengers screaming deliriously in the small passenger plane when just about to touchdown can only be imagined. All colour instantly drained from the air hostess' face immediately followed by a flush of wild pink. She looked about to pass out. The fact that she could not comprehend a single word of our heavily accented outburst did nothing to help matters.

No sparks flew, no scraping metal, it was almost a copybook landing. The unmistakable drumming of wheels over the tarmac silenced our screams instantly. The next few moments passed without even a murmur as the aircraft rolled on smoothly. The other passengers and the cabin attendant held their breaths, probably waiting for a bomb to go off. It was the first time I felt ashamed after a perfect landing! I was overcome by a strange desire to disappear into the undercarriage bay.

It was the airline authorities' turn to scream now! I assume the pilots had radioed the tower about a possible 'hijack bid' because we received a very cold reception. After the other passengers deplaned, four of us (with myself identified as the ringleader) were led under armed escort to a separate enclosure. Attempts to register a protest at being detained were silenced instantly when one of the police officers explained how deep in trouble we were and how we would do well to stop digging further. The next few hours were consumed in investigation and background checks about which the only thing I remember now is their incredulity at how a group of test pilots could mistake a Dornier 328 for a Q400! Especially when the undercarriage bay of a Dornier 328 is hidden from view of the cabin under the belly! Fatigue and expectancy had claimed another unsuspecting victim! Thankfully, we were not behind the controls.

The parting shot by one of the police officers after our innocence was established summed it up nicely "Jeez, you guys seriously need to get some sleep".

This was one advice we could not ignore. There were flights to catch the next day.

*Above: Bombardier Dash 8 Q400 showing the wheels on the engines*
*Pic by Adrian Pingstone*

*Top: Do 328-100 - Pic by Juergen Lehle*

***Kaypius is a former navy test pilot and blogs at www.kaypius.com. He holds a dual ATP rating on the Bell 412 & AW139 and flies in the offshore division of India's largest private sector helicopter operator***

freedom to discover

# Cape Town to Maun direct.

Airlink provides direct flights between Cape Town and Maun in Botswana. You now have the freedom to discover the city of Cape Town and experience the Okavango Delta, the ultimate African Safari. Through our alliance with SAA, you can enjoy convenient connections with SAA, their Star Alliance Partner airlines and other carriers throughout Southern Africa and the world. Earn Voyager Miles, book your flight direct on www.flyairlink.com or contact your Travel Agent.

Spread your wings, fly Airlink – Freedom of the African sky.


*Connecting 36 destinations in 9 African countries.*

Image courtesy Dana Allen

AIRLINK
Freedom of the African Sky

GREY 41817

# China to boost general aviation industry

**On 17 May, the State Council issued a guideline on the development of the general aviation industry, in an effort to boost the strategic new industry that saw rapid growth in recent years.**

Data shows that as of the end of 2015, China's general aviation industry had more than 300 airports, 281enterprises, and 1 874 aircrafts. The country will build new general aviation airports, bringing the total number to more than 500 by 2020. China will also support the opening of low-altitude airspace and promote research and manufacturing in the sector, according to a guideline issued by the State Council, China's cabinet.

As part of efforts to promote industry transformation and upgrades, and to further tap consumption potential, an initiative has been set to build a general aviation industry that has more than 500 general aviation airports, 5 000 aircraft, and a group of competitive enterprises by the end of 2020, according to the guideline.

To strengthen transportation services, efforts will be made to provide diversified services. For example, people in rural areas will be offered small aircraft and short-haul aviation services.

The developing general aviation industry will also benefit public services and production as it will be combined with rescue and relief work, medical aid, territorial resource exploration, environment monitoring and communication relay.

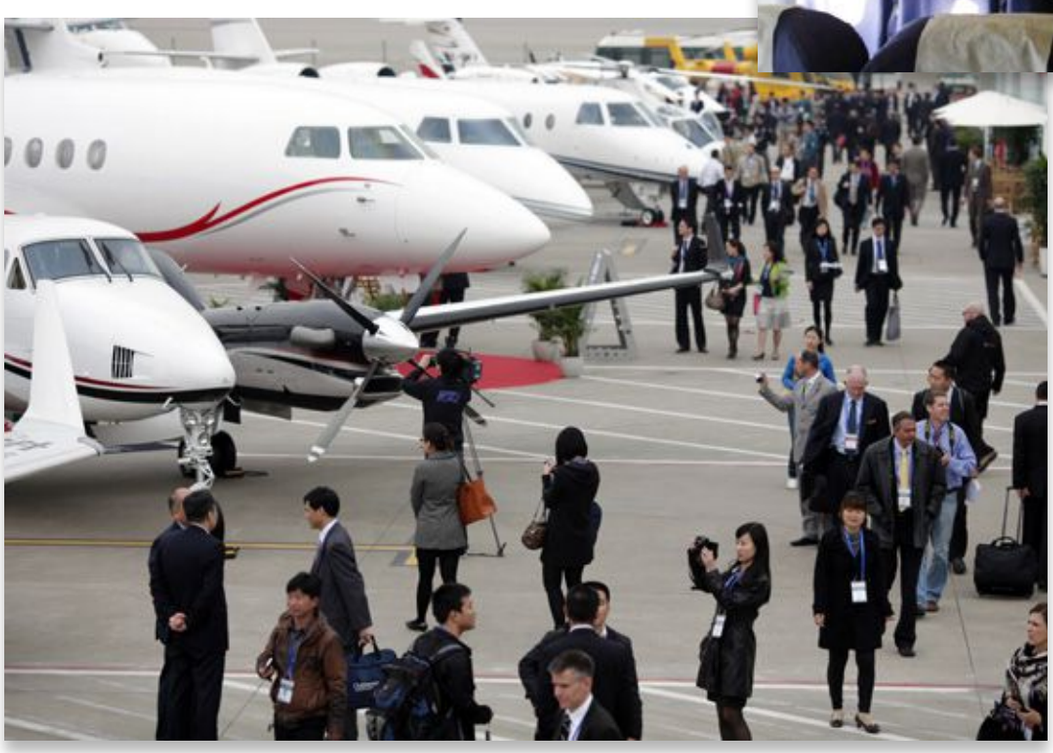
To encourage aviation consumption, general aviation is encouraged to integrate with the Internet, creative economy, and tourism, the guideline said.

According to the guideline, regional coordination should be strengthened to promote construction of all-purpose airports in the Beijing-Tianjin-Hebei region, Yangtze River Delta, Pearl River Delta, and other major city clusters.

Efforts will be made to boost aviation innovation and improve manufacturing capabilities in key aviation technologies.

Industry cluster is another target to promote industry transformation and upgrades, as 50 demonstration zones will be set up to promote aviation clusters, and international-advanced general aviation manufacturing enterprises will be forged.

International cooperation will be strengthened in aviation manufacturing, operations management and pilot training.



## *Chinese aviation sector flies into 2016 with record profits*


According to a statement by the State Council the country will encourage private investment in the sector, boost pilot training and expand the use of general aircraft in disaster relief, emergency medical services, environmental monitoring as well as national land and resources exploration.

In China, Beijing, Xi'an, Chengdu, Shanghai, Shenyang and Nanchang are major research and manufacture centers of aerospace industry. China has developed extensive capability to design, test and produce military aircraft, missiles and space vehicles. However, despite the experimental model of Y-10, which was abolished in 1984, China is still developing its civil aerospace industry, Aerospace and aircraft. •

***Left: Chinese Y-20 Strategic Military Transport Aircraft for China International Aviation & Aerospace Exhibition 2014***

# CHARTER Companies • SA

| Company | Code | Telephone | E• mail | < 20 Pax | > 20 pax | Biz Jets | V.I.P. | Long• Range | Freight | Helicopter | Special Events | Safari Charters | Contracts | Aircraft Sales | Surveys | Maintenance | Aerial Photography | Aircraft Leasing | Security Based (armed) | Line Inspections | Lodge Transfers | Export Docs and Clearing | Hangarage | Air Ambulance (Medevac) | Aircraft Management |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Virginia Airport • Durban** | | | | | | | | | | | | | | | | | | | | | | | | | |
| KZN Aviation | 031 | 564 6215 | mel@kznaviation.co.za | • | | | • | • | • | • | | • | | | | | • | | | • | | | | | |
| **Rand Airport • Germiston** | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Grand Central • Midrand** | | | | | | | | | | | | | | | | | | | | | | | | | |
| Jemax Aviation (Pty) Ltd | 011 | 805 0682 | fjoubert@jemaxaviation.co.za | • | | | • | | • | • | | • | • | | | | | | | | • | | | | |
| **Lanseria Airport** | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sahara African Aviation | 082 083 | 659 2981 305 4508 | shirley@flysahara.co.za | • | • | • | • | • | • | | • | • | • | • | | | | | | | | | | | • |
| | | | | • | | • | • | | | | • | • | • | | | | | • | | | • | | | | • |
| King Air Charter | 011 | 701 3250 | quotes@kingair.co.za | • | • | • | • | • | • | | • | • | | | • | | • | | | | | • | • | • | |
| **OR Tambo International • Johannesburg** | | | | | | | | | | | | | | | | | | | | | | | | | |
| Federal Airlines (Pty) Ltd & Bateleur Air Charter | 011 | 395 9000 | Charters@fedair.com | • | • | • | • | • | | • | • | • | • | | | | | • | | | • | | • | | • |
| **Wonderboom Airport** | | | | | | | | | | | | | | | | | | | | | | | | | |
| Flyjetstream Aviation | 24 Hr Charter number | 083 279 7853 | charter@fjsa.co.za | • | | | • | | • | • | • | • | • | • | | • | • | | | • | | • | • | • | |
| | | | | | | | | | | | | | | | | | | | | | | | | | |
| **ExecuJet Aviation Group: Lanseria and Cape Town. ExecuJet Nigeria Limited** | | | | | | | | | | | | | | | | | | | | | | | | | |
| Cape Town Int. Airport | 24 Hr Charter number 082 330 7399 | | charter@execujet.co.za | • | • | • | • | • | | | • | • | • | • | | • | | • | | • | • | • | • | • | • |
| Lanseria Int. Airport • Johannesburg | | | charters@execujet.co.za | • | • | • | • | • | | • | • | • | • | • | | • | • | • | | • | • | • | • | • | • |
| Murtala Muhammed Int. Airport Lagos, Nigeria | | | charter@execujet.com.ng | • | • | • | • | • | | | • | • | • | • | | • | | • | | • | • | • | • | • | • |
| **Durban - Natal** | | | | | | | | | | | | | | | | | | | | | | | | | |
| Starlite Aviation Operations | 031 | 5715535 | klaraf@starliteaviation.co.za | • | | | • | | • | • | | | • | • | | • | • | | | | • | | | | |

# Next-generation PW307D engine receives EASA approval

## New engine growing P&WC's presence in long-range business jet market

**Pratt & Whitney Canada (P&WC) announced that its new PW307D engine received type validation from the European Aviation Safety Agency (EASA). The company's latest generation turbofan engine was first introduced two years ago at the European Business Aviation Convention and Exhibition (EBACE).**

Validation from the European authorities completes the key engine certification and validation activities for the PW307D program, following approval from Transport Canada and the Federal Aviation Administration last year. The engine will power Dassault Aviation's new Falcon 8X, a three-engine ultra-long-range business jet which completed its first flight in February 2015 and is expected to be certified this summer.

Part of the PW300 family of business jet engines, the powerful, clean, compact and quiet PW307D solidifies P&WC's presence in the long-range business aviation segment. Through technological refinements designed to support the extended range and maximum takeoff weight of the Falcon 8X, the PW307D builds on the success of the PW307A program, which to date has delivered over 800 engines for Dassault Aviation's Falcon 7X business jet. Specifically, the new engine offers increased takeoff thrust and improved fuel consumption compared to the PW307A, along with one of the highest thrust-to-weight ratios in its class.

### Delivering Increased Range and Optimal Passenger Comfort

"Thanks to its outstanding performance, reliability and operating economics, the PW307D will help meet business jet customers' demand for increased range and optimal passenger comfort," noted Michael Perodeau, Vice President, Marketing, responsible for Business Aviation and Military Programs. "The global ultra-long- and long-range business jet is an important segment, and with the PW307D and other state-of-the-art engines in our next-generation portfolio, we are establishing ourselves as a leader in this area."

To date, P&WC has delivered over 4,600 PW300 turbofans worldwide, which have accumulated close to 16 million flight hours. The engines are recognized in the 4,700- to 8,000-lb thrust class for their low fuel consumption, economical operation and environmental friendliness, made possible in part by P&WC's TALON™ low emission combustor technology, which delivers a step change in energy efficiency and reduced environmental impact.

All PW300 models are equipped with full-authority digital engine control (FADEC), providing reduced pilot workload and advanced engine health monitoring & diagnostics, thus assuring a high standard of aircraft dispatch availability. Moreover, by using the latest innovations to deliver highly dependable, fuel-efficient power, the PW300 offers low emission TALON™ combustion and advanced shock management fan technologies providing clean and quiet performance.

### Long-Standing Customer Relationship with Dassault Aviation

Dassault Aviation has been a key customer for the PW300 family since 1999, when it selected the PW308C for the Falcon 2000EX. The engine also powers the Falcon 2000DX, 2000LX, 2000S and 2000LXS variants. Dassault also selected the PW307A for the Falcon 7X and the PW307D for the Falcon 8X.

"We are proud to have worked with Dassault Aviation for almost two decades and supported them in developing some of the world's most advanced business jets, like the Falcon 8X," remarked Perodeau. "With the PW307D, we have built on our extensive experience with the PW307A, and with over 1,000 hours of development testing for the PW307D, we are confident that the new engine will meet the high expectations of Falcon 8X customers and enhance [or strengthen] the position of both Dassault Aviation and P&WC as global business aviation leaders."

### ESP® Platinum: Maximum Peace of Mind and Aircraft Availability

The PW307D is backed by support from the industry's largest worldwide network and most experienced service experts. What's more, Falcon 8X customers will be able to take advantage of P&WC's Eagle Service Plan™ (ESP®) Platinum. This flexible pay-per-hour plan is a premium, white-glove customer service solution that offers customers peace of mind by helping them plan their maintenance costs and maximize aircraft availability. It is a testament to P&WC's commitment to rapid, customized service that addresses operators' changing needs.

More information about the ESP® program is available at www.pwc.ca/service-support.

*Technician working on PW307D*

# *Simply the best designed facility on the continent*

Designed with an ambition to host a world-class facility for stress-free business aviation at OR Tambo International Airport, Fireblade Aviation offers a full-range business terminal and charter facilities to cater for every flying need.

The FBO offers all terminal luxuries you would expect from the best for your aircraft. With a dedicated private apron, private fueling facility, hangarage and tailored services your flying assets will be looked after. Your VIP's can be hosted in the Terminal with small nuances like day rooms, el fresco kitchen offerings, an exercise room, private staterooms and boardrooms.

Our Fireblade charter fleet has full access to the FBO service bouquet. This means that you not only get world class aircraft and crew but your journey starts when you arrive at our facility.

FIREBLADE AVIATION
PROPRIETARY LIMITED

www.firebladeaviation.com

FBO Service contact the team on Fbo.Ops@firebladeaviation.com

# *Introducing the fireblade aviation charter fleet*

GLOBAL 6000

LEARJET 45XR

PC-12 NG'S

AGUSTA AW 139 HELICOPTER

AGUSTA AW 119 HELICOPTER

For Aircraft Charters contact fltops@firebladeaviation.com

# Cessna marks another program milestone, powers on the first Citation Longitude

**On 13 June the Cessna Aircraft Company, a subsidiary of Textron Aviation Inc., announced it had powered the electrical distribution system on the revolutionary Cessna Citation Longitude super-midsize jet, completing the next major step in the aircraft's path to accomplish first flight this summer. This milestone occurs just three weeks after the company successfully mated the wing and fuselage of the first Longitude in May.**

"We continue to meet our milestones through an industry-leading development schedule in order to get the Longitude into the hands of our customers," said Scott Ernest, president and CEO, Textron Aviation. "The power on stage allows our team to begin verifying the aircraft's electrical power system and paves the way for functional tests and engine runs that will get us to first flight in the coming months."

Revolutionizing the super-midsize market

# *Cessna Citation Longitude achieves wing and fuselage mate milestone*

The Citation Longitude is the company's latest innovation as it continues to invest in its family of larger business jets. The aircraft is designed specifically for maximum passenger comfort and offers the lowest cabin altitude in its class at 5,950 feet. State-of-the-art cabin technology allows passengers to manage their environment and entertainment from any mobile device, while standard high-speed internet maximizes in-flight productivity. With seating for up to 12 passengers, the Longitude features a stand-up, flat-floor cabin with a standard double-club configuration and a class leading walk-in baggage compartment fully accessible in flight.

The clean-sheet design of the Longitude integrates the latest technology throughout the aircraft, bringing customers the lowest ownership costs in this class. It features the next evolution of the Garmin G5000 flight deck and is powered by FADEC-equipped Honeywell HTF7700L turbofan engines with fully integrated autothrottles. The aircraft offers a full fuel payload of 1,500 pounds, a maximum cruise speed of 476 knots and a high-speed range of 3,400 nautical miles. With head-up display and enhanced vision capability, the Longitude facilitates eyes-up flying. The spacious cockpit incorporates easier access and an ergonomic design that fully focuses on crew comfort and efficiency. focuses on crew comfort and efficiency. •

# FAI adds four aircraft to fleet making it Germany's largest business jet operator

**German company FAI Asset Management GmbH has announced the acquisition of four Bombardier aircraft from an undisclosed vendor. The two Global Express models, and two Learjet 60 aircraft, will be leased from FAI Asset Management GmbH to the FAI Aviation Group. This makes FAI Aviation Group the largest business jet operator in Germany with a total of 20 jets operating on the FAI AOC, and a Premiere 1A on FAI owned, Fly Alpha´s AOC.**

The Learjet aircraft have already begun to support FAI's successful air ambulance business flying international medevac missions, whilst the Global Express models will be inducted into the fleet in the third quarter of 2016. They will fulfill multi-purpose roles offering VIP charters, air ambulance configuration, or a combination of the two depending on the mission requirement.

The fleet now consists of 20 Bombardier jet aircraft operated by FAI Aviation Group and includes three Global Express, five Challenger 604s, nine Learjet 60, two Learjet 55 and one Learjet 35. FAI has taken a leading position in the German Business Aviation sector. According to FAI's Chairman and owner Siegfried Axtmann the company is expecting a utilization of close to 14,000 hours of airtime which combined will generate revenues exceeding €85m by the end of 2016. FAI´s sister company Fly Alpha operates two aircraft (Premier 1a and King Air 350) on behalf of corporate owners.

"It´s a good feeling to be the largest business jet operator in Germany at a time when consolidation seems to be prevalent. With this in mind our primary goal is to continue to be one of the most profitable business jet operators in Europe and so far this year it is looking like we will achieve this again", added Axtmann.

FAI is a niche operator specialized in worldwide patient transport by air ambulance, as well logistic flight support for NGOs in hostile areas. All of the aircraft are based at the company's home base of Albrecht Dürer Airport in Nuremberg, Germany and maintained by FAI Technik. The additional aircraft also serve to strengthen the company's position as one of Europe's largest Bombardier operators, which brings significant operational and cost benefits. •

# The South African Aviation Insurance Market

By Anne Meadows, Aon South Africa's Aviation Manager

The aviation insurance market worldwide is extremely limited in comparison to other classes of insurance. Aviation insurance is highly specialised and extremely complex and it is therefore of paramount importance to only deal with brokers and Insurers who have the specialised ability to offer advice on and produce the correct products for the aviation insurance buyer.

Looking at the South African insurance market, there are a mere five insurance companies who write aviation insurance and who mainly concentrate on general aviation risks as opposed to airline business. One of the main reasons is the exposure and the cost of reinsurance protection as aircraft accidents have the tendency to result in large property damage and loss of human life claims.

## Aon's Airline Insurance Market Outlook for 2016

If one analyses the state of the aviation insurance industry in some African countries such as Botswana, Tanzania or Zambia to name a few, in order to comply with local legislation the majority of the business is written as a reinsurance of one of the local insurance companies as this prevents business and income leaving the country. The net retention that the local Insurers normally retain are small and in some cases they would even reinsure 100% of the risk holding no exposure whatsoever in fear of a large claim which may have a detrimental effect on the company's underwriting profits. The majority of rates offered by local insurance companies are reliant on what terms and conditions their Reinsurers have to offer and from past experience, they all have a very conservative approach to aviation risks, due to the large exposures that can emanate from a loss.

Lloyd's is the hub and world market leaders in the aviation underwriting sphere both in terms of airlines and general aviation business. This includes direct and reinsurance placements. All direct insurance companies have reinsurance protections in one form or another which inevitably end up in the Lloyd's of London market. Lloyd's have an impeccable reputation throughout the world for their expertise and their ability to assist customers with virtually any risk that they are approached on.

The aviation insurance market has for many years gone through soft and hard cycles and currently a soft cycle prevails which is brought about by fierce competition in the market place amongst the brokers. Whilst this is not the only reason, there are other factors that influence hard and soft cycles in the industry. The move to a hard cycle would need the aviation insurance industry to suffer major losses before the hard cycle would start to move forward.

Having said this, the big question which remains is how long the market can sustain the current rating levels and when it does turn hard, what effect will this have on the insurance buyer? It will be advisable to take advantage of the soft market, but to put funds aside for the day that the market hardens.

## Factors that influence Aviation Rates

There are a number of factors that influence rates and premiums which include:

- The availability of capital commonly referred to as capacity
- The price of reinsurance protection
- Competition within the insurance market
- Specific claims history or as a whole
- Size of risk exposure
- Age and type of aircraft operated
- The country or region where the aircraft is being operated
- Other factors include utilisation, crew training and maintenance

Accurate information provided to the underwriter is critical to ensure successful and swift claims settlement. However, non-disclosure of any material information will lead to underwriters repudiating a claim.

## Selection of Brokers

Aviation insurance is a highly specialised field and if you are an aircraft owner or operator seeking insurance you need to take the following into consideration when selecting a broker.

## Ensure that the broker:

- has the knowledge and experience to deal with your insurance requirements;
- has the relevant staff and trained personnel to handle your queries at all levels;
- has access to all the aviation markets both locally and overseas;
- has the ability to be flexible in negotiating the right product at market going rates;
- is properly licensed and meets the requirements of being a financial services provider;
- has Professional Indemnity insurance in place;
- has the ability to respond quickly and efficiently in the event of a claim which is critical when a loss occurs.

The ability to offer aviation insurance has its advantages, especially in the corporate market where many prospective clients hunt for an insurance solution that offers all-encompassing cover across a diverse variety of risks. However, the aviation insurance market comprises of only five specialist aviation underwriters. What this essentially means is that prospective clients are very welcome to test the market but that it would be advisable to be prudent with the number of insurance brokers that are approached on aviation cover as they will invariably land up dealing with the same underwriter.

Rather do some research on the available aviation brokers in your area or who you feel will meet your expectations, then select two brokers to approach the market and from there select the broker who would best suit your needs. By applying this approach, you would have achieved the best possible result. •

# FLYING SCHOOLS SA

| Name of School | Code | Telephone | E-mail | Turbine training & More | Ab-initio training | Single- engine | Multi-engine | Night rating | IF rating | Instructors rating | Simulator training | Conversions | CPL theory | CPL practical | Helicopter training | Tail draggers | Pilot shop | Conferences | Hire and fly | Charters | Aerobatic training | Beginners/advanced | Gyro-copter training | Microlight & ferry flights | Accommodation | Aircraft/heli sales | Club facilities | Advanced Training |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rand Airport - Germiston** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Johannesburg School of Flying | 011 | 827 9827<br>824 3990 | info@jsf.co.za | | • | • | • | • | • | • | • | • | • | • | | | • | • | • | | | • | | • | • | | • | • |
| **Wonderboom Airport • Pretoria** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Blue Chip Flight School | +27 12 | 543 3050 | bluechip@bluechip-avia.co.za | • | • | • | • | • | • | • | • | • | • | • | • | | • | • | • | • | | • | | • | • | • | • | • |
| **Rhino Park Airfield • Pretoria** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| LS Aviation Training | 083 | 860 5225 | info@Lsat.co.za | | • | • | | • | • | • | | • | • | | | • | | | • | | | | | | | | | |
| **Lanseria Airport / Pietermaritzburg** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Gryphon Flight Academy | 082 | 528 1208<br>562 5060 | elzette@gryphonflight.co.za | • | | | • | | • | • | • | • | | • | | | • | | | • | | • | | | • | | • | |
| Aeronav Academy | 011 | 701 3862 | info@aeronav.co.za | | • | • | • | • | • | • | • | • | • | • | | | | | • | | | | | | | | | • |
| **Mafikeng Airport** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| AUAA | 018 | 385 1080 | auaa.admissions@gmail.com | • | • | • | • | • | • | • | • | • | • | • | | | | • | • | • | • | • | | | • | | | • |
| **Grand Central Airport • Midrand • Johannesburg** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Lanseria Flight Centre | 011 | 312 5166 | info@flylfc.co.za | • | • | • | • | • | • | • | • | • | • | • | | • | • | | • | • | | | | | • | • | | |
| Flight Training Services | 011 | 805 9015/6 | fly@fts.co.za | | • | • | • | • | • | • | • | • | • | • | | • | | | • | | • | • | | | • | | | |
| ATS | 011 | 315 4391 | ops@atsheli.co.za | • | • | • | • | • | • | • | • | • | • | • | • | | • | • | • | • | | • | | | • | • | • | • |
| **Durban** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Starlite Africa Aviation (Pty) Ltd | 031 | 571 6600 | kateo@starliteaviation.co.za | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • |
| **Freestate • Bloemfontein** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Westline Aviation | 051 | 451 1717 | pro@westline.co.za | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | |
| **Mossel Bay** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Starlite Africa Aviation (Pty) Ltd | 044 | 692-0006 | kateo@starliteaviation.co.za | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • |
| **Port Elizabeth** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Aptrac | 041 | 381 0327 | grant@aptrac.co.za | • | • | • | • | • | • | • | • | • | • | • | | | • | • | • | • | • | • | | • | | • | • | • |

# Textron Aviation reveals superior SETP performance and cabin details

**On 23 May Textron Aviation revealed further program details around the development of its highly anticipated single engine turboprop aircraft (SETP), including unmatched performance specification targets, a superior passenger experience and the programme's timeline. The company also announced at the European Business Aviation Convention and Exhibition (EBACE) that letters of intent for the high performance, clean sheet SETP were being accepted**

The SETP will be designed to have cruise speeds of up to 285 knots and full fuel payload of 1,100 pounds. With a planned range of 1,600 nautical miles at high speed cruise with one pilot and four passengers, the aircraft will be able to fly from Los Angeles to Chicago, New York to Miami, London to Moscow or Geneva to Istanbul. It will feature the widest and most comfortable cabin in its segment while offering best-in-class operating costs. The program is targeting first flight in 2018.

"Developed with the pilot and passenger at the forefront, we have designed this airplane to be the clear winner in this segment, from class-leading performance and ownership costs, to superior cabin comfort and versatility," Scott Ernest, president and CEO, Textron Aviation. "We have been intentional with every detail throughout the aircraft, resulting in an exceptional airplane that is sure to impress owners, pilots and passengers alike."

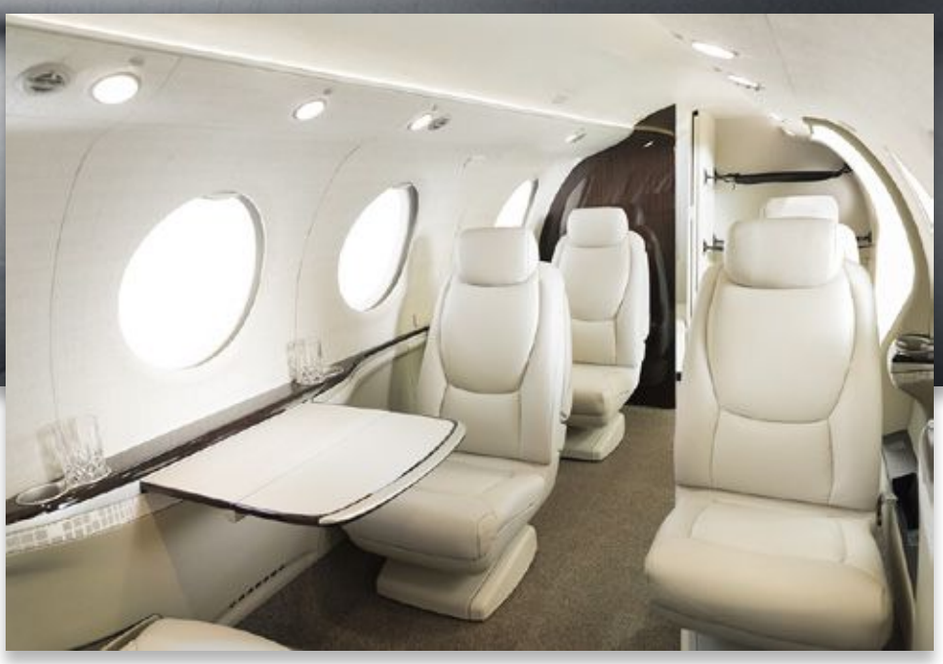
## Outperforming the single engine turboprop market

The SETP will incorporate technology specifically designed to reduce pilot workload. The aircraft's flight deck will be powered by Garmin's G3000 intuitive touchscreen avionics suite and will include high-resolution multifunction displays and split-screen capability. The G3000 avionics suite planned for the SETP includes weather radar, advanced Terrain Awareness Warning Systems (TAWS), and automatic dependent surveillance-broadcast (ADS-B) capabilities, which will make it compliant with a significant aspect of future Next Generation (NextGen) air traffic control requirements.

Announced at NBAA 2015, the SETP will be powered by GE's new advanced turboprop engine. The FADEC-equipped, 1,240 shaft horse power (SHP)-rated turboprop engine will ease pilot workload with its single-lever power and propeller control. The engine will provide an initial 4,000 hour time between overhaul and offer class-leading performance retention for an outstanding hot/high capability. The airplane will be equipped with McCauley's new 105-inch diameter composite, 5-blade, constant speed propeller, which is full feathering with reversible pitch and ice protection.

## Leading the passenger experience

The SETP's flat floor cabin is designed to be the largest in its segment and will offer the



*Above: Along with room for one pilot, the SETP will seat up to eight passengers.*

versatility to easily convert between passenger and cargo configurations. The aircraft will feature a class-leading 53-inch wide aft cargo door, perfect for loading large cargo and ideal for use in many special mission applications.

Along with room for one pilot, the SETP will seat up to eight passengers, and will boast a digital pressurization system maintaining a 6,130 foot cabin altitude at a service ceiling of 31,000 feet. The aircraft will feature six individual reclining seats and an optional belted lavatory seat with pocket door enclosure located in the back of the cabin, as well as large cabin windows, interior LED lighting, a forward refreshment cabinet and an in-flight accessible baggage compartment within the pressurized cabin.

"We are actively investing in new products and remain focused on bringing smart innovation to market that drives our customers' businesses and missions forward. The SETP is a testament to that approach," said Ernest. "This aircraft will be a perfect complement to our existing Cessna and Beechcraft product lineup and will give our customers the opportunity to move seamlessly through our family of aircraft, regardless of their mission."

The company has developed a cabin prototype, which it is showcasing to customers at its headquarters in Wichita, Kansas, and plans to display at this summer's EAA AirVenture Oshkosh. •

# Rockwell Collins' FANS 1/A solution for Dassault Falcon 50EX aircraft now certified

Convenient package combines avionics upgrade with FANS 1/A training, letter of authorization assistance, data link connectivity and flight support services

Rockwell Collins' Future Airspace Navigation System (FANS) 1/A solution for Dassault Falcon 50EX aircraft that have been upgraded with Pro Line 21™ avionics is now certified as part of a supplemental type certificate held by Dassault Falcon Jet. The FANS 1/A solution is available from authorized Rockwell Collins dealers as an option with the Pro Line 4™ to Pro Line 21 upgrade.

With FANS 1/A, Falcon 50EX aircraft operators will comply with regulations for operating over the North Atlantic and be able to access preferred wind-efficient transatlantic routes to save time and fuel.

To complement the FANS upgrade and other connectivity needs, Rockwell Collins' solution goes beyond hardware and includes:

FANS 1/A Federal Aviation Administration letter of authorization assistance

Interactive flight crew training with real-time feedback to improve understanding of the FANS environment

A one-year subscription to Rockwell Collins' ARINCDirectSM premium flight planning solution and mobile application—with ARINCDirect, operators will gain best-in-class flight planning, weather, VHF/SATCOM data link connectivity and 24/7 global support.

"For Falcon 50EX owners, the FANS 1/A certification makes the already popular Pro Line 4 to 21 upgrade an extraordinary, all-in-one approach for compliance with airspace modernization deadlines," said Craig Olson, vice president and general manager, Business and Regional Systems for Rockwell Collins. "Pro Line 21 brings turn-key compliance with FANS 1/A, ADS-B, WAAS and more, and aircraft value is further enhanced with extensive situational awareness tools like synthetic vision, electronic charts, graphical weather and more."

## Rockwell Collins FANS 1A

Rockwell Collins has already fielded several other FANS 1/A solutions for business aircraft, including the Challenger 604 and more than 300 new Pro Line Fusion®-equipped Bombardier Global 5000 and Global 6000, and Gulfstream G280 aircraft. The company's FANS 1/A solution is also part of Bombardier's Pro Line 21™ "Advanced" flight deck for new Challenger 350 and Challenger 650 aircraft, and aftermarket Challenger 300 and Challenger 605 aircraft. Additionally, the company has announced that FANS 1/A will be available for Falcon 2000 operators with its Pro Line 4-to-21 flight deck upgrade. •


# Beechcraft Pro Line Fusion-equipped King Air C90GTx awarded FAA and EASA type certifications

**Beechcraft Corporation, a subsidiary of Textron Aviation Inc., a Textron Inc. company, has announced it has received type certifications from both the Federal Aviation Administration (FAA) and the European Aviation Safety Agency (EASA) for the new Pro Line Fusion-equipped Beechcraft King Air C90GTx turboprop.**

With this achievement, the company has now completed FAA and EASA certifications to include Pro Line Fusion avionics systems as standard equipment on all current production models of the King Air.

"Continuous product improvement and enhancements based on operator feedback is why more than 7,300 Beechcraft King Air turboprops have been delivered to customers around the world," said Kriya Shortt, senior vice president, Sales & Marketing. "Our ongoing strategy of driving new technology into our aircraft in alignment with customers' needs ensures owners and operators get the value proposition, performance and passenger experience they appreciate from the King Air series."

## Avionics

Pro Line Fusion for the King Air brings one of the most trusted avionics architectures to the first full touchscreen flight display system. The new avionics system changes how operators aviate, navigate and communicate through a one-of-a-kind intuitive flight deck interface. Its three 14-inch displays are interchangeable, high-resolution with touch screen and cursor control. Other performance-enhancing capabilities include:

- Integrated touchscreen checklists
- Intuitive graphical touchscreen flight planning
- High-resolution Synthetic Vision System with patented airport dome graphics
- Convenient presets to reconfigure all three displays with a single touch
- Dual multi-sensor flight management systems
- Available automatic wireless database and chart uploads
- Open and scalable architecture for future upgrades and mandates

Pilot training for the Pro Line Fusion King Airs is offered at TRU Simulation + Training's new ProFlight training center near Tampa, Florida. Additionally, TRU offers aircraft maintenance training for the new models in its newly renovated Wichita, Kansas facility.

## Cabin upgrades

In addition to the new Pro Line Fusion avionics, the cabin now offers an enhanced passenger experience. With Wi-Fi capability available on all King Air models, the personal device-centric cabin environment allows customers to stay connected and productive throughout their flight experience. Also standard on all three models are electronically dimmable window shades, offering a simple interface that provides clearer views and darker shading at the touch of a button. •





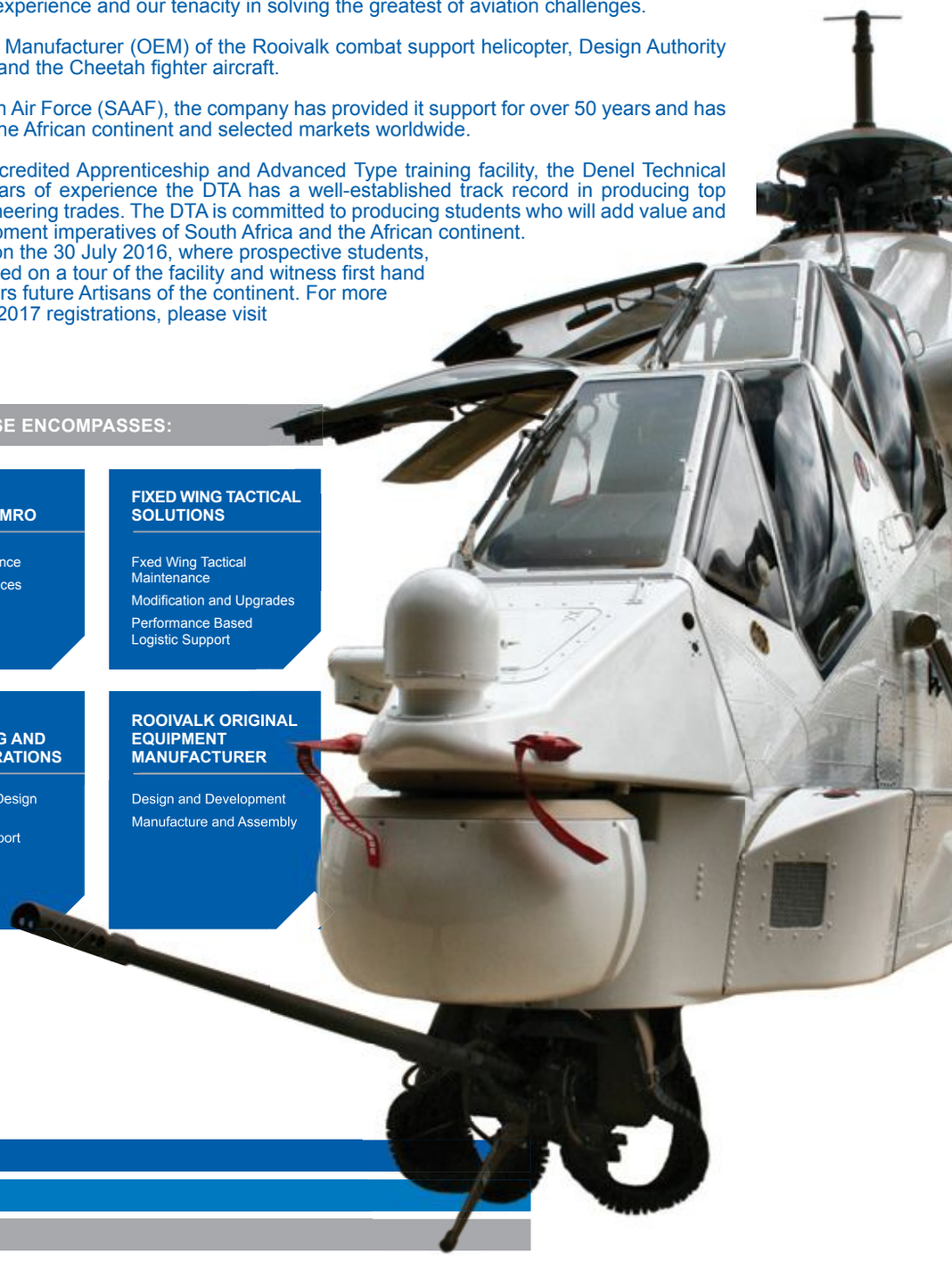

## DENEL AVIATION - LEADERS IN THE INDUSTRY

Denel Aviation, a division of Denel (SOC) Ltd, provides leading and accredited maintenance, repair and overhaul (MRO) services for fixed and rotary wing aircrafts. Denel Aviation is accredited by Lockheed Martin, Russian Helicopters and Airbus Helicopters. Our expertise encompass design, upgrading and integration of aircraft systems. Our portfolio of specialised services is built on over five decades of experience and our tenacity in solving the greatest of aviation challenges.

Denel Aviation is the Original Equipment Manufacturer (OEM) of the Rooivalk combat support helicopter, Design Authority of the Oryx medium transport helicopter and the Cheetah fighter aircraft.

As a strategic partner to the South African Air Force (SAAF), the company has provided it support for over 50 years and has expanded its capability base to support the African continent and selected markets worldwide.

Denel Aviation has an internationally accredited Apprenticeship and Advanced Type training facility, the Denel Technical Academy (DTA). With more than 40 years of experience the DTA has a well-established track record in producing top Artisans in the aviation and general engineering trades. The DTA is committed to producing students who will add value and contribute to the socio-economic development imperatives of South Africa and the African continent.
The DTA will have its annual Open Day on the 30 July 2016, where prospective students, parents and sponsor companies are invited on a tour of the facility and witness first hand what the DTA is all about and what it offers future Artisans of the continent. For more information on the DTA Open Day or for 2017 registrations, please visit www.deneltechnicalacademy.co.za



### DENEL AVIATION EXPERTISE ENCOMPASSES:

**ROTARY WING MRO**

- Modifications and Upgrades
- Maintenance
- Technical Support
- Logistic Support

**FIXED WING TRANSPORT MRO**

- Aircraft Maintenance
- Specialised Services
- Product Support

**FIXED WING TACTICAL SOLUTIONS**

- Fxed Wing Tactical Maintenance
- Modification and Upgrades
- Performance Based Logistic Support

**COMPONENT MRO**

- Avionics, Electrical and Oxygen Components
- Ground Support and Test Equipment
- GS & TE Disciplines Supported

**ENGINEERING AND FLIGHT OPERATIONS**

- Product OEM & Design Authority
- Engineering Support
- Flight Test
- Civil Aircraft

**ROOIVALK ORIGINAL EQUIPMENT MANUFACTURER**

- Design and Development
- Manufacture and Assembly

**T**: 011 927 2620 | **F**: 011 927 5131
**E**: marketing@denelaviation.co.za
**W**: www.denelaviation.co.za

DENEL AVIATION

DENEL

# Satcom Direct announces its latest innovation, SD Pro: the first fully integrated flight operations management platform

**SD Pro brings together patented Satcom Direct (SD) products and services with best-in-class integration partners to deliver real-time data about the aircraft via a single interface. SD Pro lets you view and manage flight logs, performance data, scheduling, trip planning, maintenance information, operating history, and more. Demos of the new technology are available at Satcom Direct's EBACE exhibit S115.**

SD Pro aggregates information from multiple sources the flight department is already using, into a web-based display, so that every member of the team can access it from their desktop, tablet or mobile device. Designed to be a single point of access, the SD Pro interface displays the information via modules on its customisable dashboard that can be tailored to meet the varying needs of flight departments and individual team members. Operators can choose which modules to add to the SD Pro dashboard based on their operational requirements.

"We conceived the idea for SD Pro when we saw how members of aircraft management companies and flight departments had to access numerous information sources, multiple screens, and disparate access points to do their jobs. SD Pro changes that by bringing together many of these functions into a modular dashboard. We've already partnered with a number of providers to integrate the systems flight departments use most – and more partnerships are in the works," said David Greenhill, President of SD.

SD Pro not only brings together information from multiple third-party providers, it offers powerful data capture capabilities from its value added services, FlightDeck Freedom® (FDF) premium datalink service, and the Satcom Direct Router (SDRTM). This allows the extraction of operational data from the aircraft such as telemetry and position data, fuel indications, operational parameters and more. Revolutionary SD Pro technology processes the data and securely stores it in the state-of-the-art SD Data Center. SD Pro is designed to grow, with additional modules in development to deliver the functionality flight departments require.

"SD Pro synchronizes the flight department with the aircraft, in real-time. The SD Pro platform is even more powerful when combined with the SDR and FDF. Their advanced data capture capabilities create a reliable historical record for the life of the aircraft, and save money by accurately capturing cycles and times down to the second," said Jim Jensen, Founder and CEO of SD. "The future of flight operations management is here."

Flight Departments interested in more information about SD Pro can call
**+1 321 777 3000 (US)**
or
**+44 1252 554 460**
(international)

## The Aviation Nutritionist wants you to fly healthy

**Sarah Wilson, The Aviation Nutritionist, championed how the importance of a healthy diet can help stressed high flyers, criss-crossing time zones every week keep at their optimal best when travelling at 35,000 ft.**

Sarah says the secret to getting the right nutrition is all down to "internal" tailoring and personalisation, centred on understanding your genes. "When flying at altitude it is useful to understand your nutritional needs; how well you detoxify; your salt and caffeine sensitivities; your tolerance to lactose and gluten, your antioxidant needs, your sensitivity to weight gain based on your fat intake and what type of exercise best suits your genetic make-up.

By simply tailoring your diet when you fly, based on your genes, you can really feel your best, reach your peak performance and ultimately gain a competitive edge.

Caffeine, for example, is regularly used to increase performance, but if you look at an individual's gene profile this could actually be having the opposite effect. The same can be said for gluten which may manifest as fatigue, 'foggy' head, joint pain or even depression. The body's ability to absorb key nutrients, e.g. vitamin C and D, may be impacted which is vital for the immune system and is often lost in a time of stressd.

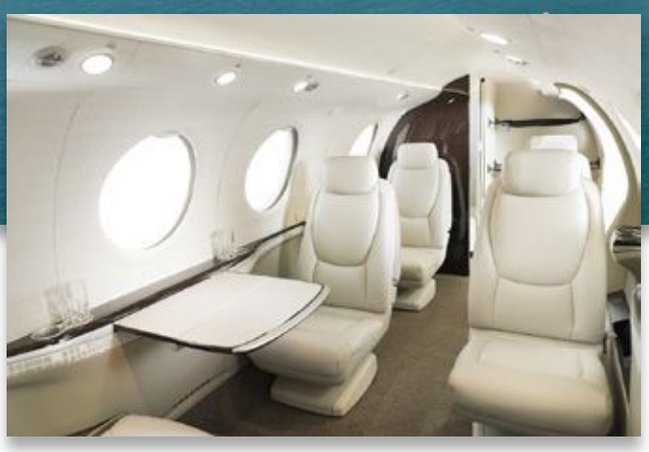
Testing via a salvia swab allows Sarah to create a unique nutritional profile for clients, while a clinic visit offers a more detailed addition, including a blood test to give complete bespoke health map profile. From this a bespoke diet plan is recommended.

Serving a delicious nutritional meal is one of the best ways to create a positive impact on one's daily life and their onward impact on others.

A personal diet plan can easily slot into the bespoke business jet experience and this is becoming easier, especially among the larger operators who are employing their own executive chef

For further information contact Sarah Wilson on
**+44 (0) 20 7205 2848**
**+44 (0) 77 6503 5177**

# The PC-24 Flies at EBACE 2016!



A première at this year's European Business Aviation Exhibition (EBACE) in Geneva: the first PC-24 prototype took part of the outdoor display at EBACE on 24 May 2016. Meanwhile, at the indoor stand, Pilatus presented the new PC-24 interior design, which has now been brought up to series production standard. The two PC-24 prototypes are currently engaged in a challenging programme of test flights. Various key tests have already been completed with success.

The first PC-24 prototype, 'P01', briefly interrupted its programme of test flights to be at the official EBACE opening day, where it went go on display at the Pilatus outdoor stand – next to the PC-12 NG.

Pilatus is very happy with the progress of the test flight programme. Chairman of the Board of Directors of Pilatus, Oscar J. Schwenk, commented. "Together, the two prototypes have completed 300 flights and over 500 hours in Switzerland, Spain, Scotland and Iceland. In the past few months we have conducted numerous important tests to explore the flight envelope and observe how the aircraft handles in natural icing conditions. The results are extremely positive and confirm that the PC-24 will be a superb aircraft in line with the high standards of our 'Pilatus Class' – exactly as our customers expect. I'm delighted we had the opportunity of showing off the PC-24 at a trade fair for the first time ever - it's an excellent opportunity to convince more potential customers that our unique Super Versatile Jet offers unparalleled performance."

## Cabin reaches series standard

There was an additional première with the presentation of the interior, which has now been brought up to production standard. Visitors to EBACE were the first to see the new design lines.

Hand in hand with Pilatus, Designworks, a BMW Group Company, has created six stylish colour concepts for the PC-24, each one named after a well known ski resort, e.g. "St. Moritz", "Zermatt" or "Aspen". The various colour worlds were inspired by the shades of nature found at each location, and have been chosen to convey a feeling of luxury and security.

Pilatus has combined the finest materials with many special ergonomic touches: the spacious PC-24 cabin with its entirely flat floor can be divided into separate zones, for example, to allow simultaneous use for work or relaxation. The generous, ergonomic seats can be adjusted individually. An In-Flight Entertainment System is provided for passengers. •

# Robinson Helicopter Company

**Robinson Helicopters has long enjoyed a well-deserved reputation for supplying the industry with hard-working machines that deliver high performance combined with exceptional reliability.**

The 5-place R66 Turbine is Robinson's largest and most powerful helicopter. Like the R22 and R44, the R66 is built to be exceptionally reliable, economical and easy to maintain while performing as well or better than its more expensive competitors.

The R66 retains many of Robinson's design features including a two-bladed rotor system, T-bar cyclic and open cabin configuration but what distinguishes it from its smaller siblings is its fifth seat, spacious baggage compartment and the Rolls-Royce RR300 turboshaft engine rather than the Lycoming O-360 that powers the R22, the O-540 carbureted engine used in the R44 Raven I and R44 Clipper I, and IO-540 fuel-injected engine in the R44 Raven II and R44 Clipper II.

Designed specifically for the R66, the RR300 is powerful, lightweight, and highly reliable. An Engine Monitoring Unit (EMU) continuously records gas generator/ compressor RPM, power turbine RPM, engine torque and measured gas temperature (MGT). The RR300 operates on Jet A fuel and provides increased reserve power, additional payload and improved altitude performance. Added safety features include energy

# HELICOPTER Companies in SA

| Company | Code | Telephone | E-mail or Fax | Aerial Photography/Filming | Lifting | International Operations | Aid Work | Air Support | Maintenance Support | Rescue Operations | Contract Work | Mining Support | CPL Helicopter Licence | Tours and Flips | Vehicle Tracking | Game Capture | Agricultural Aerial | Applications | *Ab Initio* Training | Comm Licence | Club Facilities | Accommodation | Sales |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **VIRGINIA AIRPORT - DURBAN** | | | | | | | | | | | | | | | | | | | | | | | |
| KZN Aviation | 031 | 564 6215 | mel@kznaviation.co.za | • | | • | • | • | | • | | | | • | • | • | | | | | | | |
| **JOHANNESBURG NORTH - AERO 57 HELIBASE** | | | | | | | | | | | | | | | | | | | | | | | |
| Chopper Worx | 011 | 021 9414 | info@chopperworx.co.za | • | • | • | • | • | • | | • | • | | | | • | • | | | | | | |
| **GRAND CENTRAL AIRPORT - MIDRAND** | | | | | | | | | | | | | | | | | | | | | | | |
| Ultimate Heli | 011 | 044 5555 | info@ultimateheli.co.za | • | • | • | • | • | • | • | • | • | | • | • | • | • | | | | | | |
| **WONDERBOOM AIRPORT - PRETORIA** | | | | | | | | | | | | | | | | | | | | | | | |
| Skyhorse Aviation | 021<br>012 | 789 0509<br>809 3571 | info@skyhorse.co.za | • | • | • | • | • | | • | • | • | | • | | • | • | | | | | | |
| **RAND AIRPORT - GERMISTON** | | | | | | | | | | | | | | | | | | | | | | | |
| Henley Air | 011 | 827 5503 | andre@henleyair.co.za | • | • | • | • | • | • | • | • | • | • | • | • | • | • | | • | • | • | | • |

*Above: Robinson announced an optional 43-gallon auxiliary fuel tank for its R66 Turbine helicopter, extending the helicopter's range by as much as 200 nautical miles.*

absorbing seats and a bladder fuel tank.

All three Robinson's are fitted with a two-bladed rotor system that eliminates the need for lag hinges, dampers, and hydraulic struts while the aluminum and stainless steel construction of main rotor blades minimizes environmental wear and tear.

Hydraulic power controls eliminate stick shake and feedback forces. A center-positioned T-bar cyclic enables a comfortable grip position and allows trouble-free entry and exit of the cabin. The left side flight controls are removable. Transmit, intercom, and memory channel radio controls are integrated into cyclic grip. The voice-activated intercom eliminates the need to use intercom switches during doors-on flights. Intercom switches are included for doors-off flights. Rotor brake allows the pilot to stop the rotors quickly, reducing shutdown time and risk of injury to passengers and ground personnel.

Automatic clutch engagement simplifies the starting procedure, reducing the possibility of an over-speed during start-up. Carburetor heat assist enhances safety by adding carburetor heat when the collective is lowered and reducing carburetor heat when the collective is raised

Robinson Helicopter's recently announced that a collective activated hour meter along with an updated hub and redesigned main rotor spindles are standard on all new R22 Beta II helicopters. Previously, the R22 used an oil-pressure-activated meter that records all engine run time. The new collective activated meter records collective up (flight) time and does not include engine warm up and cool down time.

The new meter and redesigned spindles benefit R22 buyers because the collective-activated meter can extend component lives by up to 12% and the redesigned spindles are not subject to repetitive dye-penetrant inspections.

The company received FAA certification for its two-place R44 Cadet helicopter on 6 May 2016. Combining the best of the R22 and R44, Robinson believes the Cadet's modest price of $339,000 (with floats $367,000) will appeal to the training market as well as operators that want the economy of a small helicopter with the comfort, power, and performance of a larger helicopter.

The Cadet's airframe, rotor system, and power plant (Lycoming O-540-F1B5) are the same as the proven R44 Raven I. Where the Cadet differs is the rear seats have been removed providing ample cargo space, the maximum gross weight has been reduced to 2200 lb, and the engine power has been de-rated to 210hp takeoff and 185hp continuous. The lower weight and de-rated power provide increased performance margins at high altitudes and extend the time between overhaul from 2200 hours to 2400 hours.

R44 Raven and Clipper helicopters are high performing, reliable, and easy to maintain. A lightweight airframe and aerodynamic fuselage optimise airspeed and fuel economy. The helicopters' low tail-rotor tip speed, newly designed muffler, and large cambered tail reduce flyover noise levels.

R44 helicopters feature the latest in technology including streamlined instrument panels and crashworthy fuel bladder tanks. The Raven I features carburetor heat assist that enhances safety by adding carburetor heat when the collective is lowered and reducing carburetor heat when the collective is raised. The R44 RAVEN II is powered by a Lycoming IO-540 fuel injected engine. The IO-540 delivers better altitude performance, increased payload, and eliminates the need for carburetor heat. •

# HALO Aviation

# Inaugurates 24 Hour HEMS


*Crew prepare the BK117 for flight*

*BK117 on scene of a mass casualt incident involving a tour bus.*
*Credit: Jan Meiring*

## Emergency Service

by Charmaine de Villiers

**For critically injured accident victims time is of an essence and Helicopter Emergency Services(HEMS), can provide that extra time with on-the-scene medical assistance and rapid** transport to the nearest hospital.

In several South African provinces that service is provided by HALO Aviation with a Head Office based at Lanseria International Airport and helicopters hangered in Bloemfontein, Free State, and in Klerksdorp in the North West.

Of even more importance is the fact that these helicopters are available 24 hours a day, seven days a week thanks to the air assets owned and operated by the company. At present HALO Aviation makes use of their Bell 222's, 407, and LongRanger L4 as well as two BK117's, one of which will be used in Gauteng as from the end of July. This helicopter will also be equipped with a hoist to be utilised in rescue work. As per CAA requirements, helicopters used for medical transport must be specifically configured as air ambulances. Helicopters used by HALO for medical transport carry a doctor and paramedic or two paramedics as well as one pilot for daytime operations and two pilots for night flights.

For any medical evacuation the HALO helicopter could be termed a flying ICU as it carries similar equipment including ventilator, ECG machine, infusion sets and medical monitoring systems. There are eighteen pilots, sixteen paramedics and a trauma doctor on permanent staff although additional medical crew are brought in whenever necessary. Each doctor is a specialist in their field, normally emergency/trauma medicine.

HALO Aviation operates two 12 hour shifts per day with crew completing 15 shifts a month. Wayne Broodryk, Chief Flight paramedic who has 12 years' experience on Advanced Life Support, explains: "The day shift starts at 05:45 with a handover from the night crew. Any challenges on missions that may have arisen are discussed and the day crew has a briefing covering fuel requirements, any scheduled flights, weather forecasts, who the primary and secondary paramedic is for the missions. The helicopter and equipment is thoroughly checked."

### How do paramedics cope with the stress?

"I do not get personally involved," says Wayne. He points out that this is his job but feels that no paramedic can allow themselves to get involved by following up with their patients or visiting them. This can lead to emotional and psychological stress. For him the most difficult type of emergency involves children, particularly drownings as there is no physical injury, just disbelieving parents and a child.

"When we get back to the base we de-brief, chat about the flight over a coffee and see what positive changes we can still make," says Wayne.

### Strong growth

Established in 2010 HALO Aviation has grown exponentially over the past six years and today holds emergency helicopter response contracts for Gauteng, North West Province, Free State and is currently holding negotiations with KwaZulu Natal, Mpumulanga and Limpopo Departments of Health.

"The Free State 24 hour HEMS was a pilot project by the Department of Health under Premier Ace Magashule and Health MEC, Dr Benny Malakoane. Since October 2015 the BK117 has been based in Bloemfontein. North West Department of Health followed suit with the round-the-clock response starting on 1 June 2016," explained Ryan Horsman, Director of HALO,

*HALO 2 landing at Universitas Hospital, Bloemfontein.*

# COMPREHENSIVE AND COST EFFECTIVE
# TURN KEY SOLUTIONS
## FOR SPECIFIC AVIATION REQUIREMENTS

THE ENTIRE AFRICAN CONTINENT

HALO Aviation operates a number of single and twin engine helicopters as well as fixed wings

Our solid base of aviation experience has enabled us to successfully diversify our operation to include:

- CORPORATE CHARTERS
- GOLF SAFARIS
- AEROMEDICAL CONTRACTS
- SCENIC FLIGHTS
- GAME COUNTING
- SLINGING
- OFFSHORE PLATFORM/RIG OPERATIONS

+2786 111 61 07 ◢ info@haloav.co.za ◢ www.haloav.co.za

HALO AVIATION


*Bell 222 UT 'HALO 4'*
*operated for the North West*
*Department of Health EMS*
*Pic: Mark Mansfied*


HALO 4
ZT-RRM
DANGER
NORTH WEST EMERGENCY
MEDICAL SERVICES

by Charmaine de Villiers

who is justifiably proud of the work that the company is doing with its aeromedical service.

"The authorities in the Free State are amazingly supportive and progressive," he says of the Health Department responsible for the pilot project. Ryan's involvement in the medical field does not end with providing air transport - the Free State Health Department of Health together with HALO, initiated an outreach programme whereby doctors are flown to outlying areas to provide treatment for those unable to reach hospitals or other medical facilities.

Another distinct advantage for HALO's medical transport of neo-natal babies is that not only is the baby transported in its incubator attended by paramedics, but the aircraft capacity affords the mother the ability to travel with her precious bundle.

Medical rescue whether for motor vehicle collisions, transport from remote areas or other rescues, generally requires assistance from people on the ground who can provide information regarding access, ground conditions and any obstacles that may prove dangerous for the helicopter. Once a call comes in the pilot checks weather conditions and routes and within a short time the aircraft is in the air. Between 100 – 150 flying hours a month can be spent on aero medical flights undertaken by HALO.

## Training, Charters and Game counting

Although aeromedical work forms an important part of the day to day operation at HALO Aviation, the company also conducts pilot training and conversions courses on a number of single and twin engine helicopters. Both helicopters and fixed wing aircraft – Beechcraft King Air 200,1900, and Learjet 35 – are used for charters and medical evacuations. At present the B1900 is based in Monrovia, Liberia, where it services West African needs.

HALO's personal, corporate and VIP charter division provides service to golf resorts, games loges and various other destinations as required by passengers.

Scenic flights are easily arranged and for those romantic souls looking for the ideal way to propose – the top of a mountain, middle of a game park or any of the myriad beautiful landscapes in South Africa are easily accessible.

Game counting is another function performed by the company with precision and attention to technical detail while ensuring the highest level of safety to pilot and game.


***Above: Flying ICU** - Pic: Mark Mansfield*


***Left: BK117 B2 'HALO 2' operated for the Free State Department of Health EMS***

## The most important factor in his life? A solid reputation!

An extremely busy person, Ryan himself wryly admits that much of his time is spent travelling and coordinating the various functions of HALO Aviation together with his two business partners and an amazing operations division.

***Left: Lady pilots Nadia Hastings and Chantél Benadie***
***Pic: Mark Mansfield***


*Free State HEMS, leading the way*
*Photo: Alex Henning*

Expansion is always a possibility but he is adamant that safety and regulatory compliance are the most important factors in any operation and his entire business ethic hinges on one factor – a solid reputation.

Ryan is also an avid aviation enthusiast and HALO Aviation was established utilising a single helicopter and small staff complement. Today HALO employs just over 50 personnel and he speaks with pride of the dedication and hard work of the team. •

# AMO's South Africa

| Company | Code | Telephone | E-mail or Fax | Fixed Wing | Helicopter Maintenance | Avionics | Piston Engines | Turbine Engines | Propellors | Weight / Balances | Paint | Interior | Sheet Metal Work | Rebuilds | Overhauls | Electrical Work | NDT Testing | Refurbishments | Structural Repairs | Inspections | NTCA Aircraft | Seat Belts | Instruments | R22 and R44 only | Bell Heli Components | Heli Component Overhaul | Design Organisation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **KRUGERSDORP** | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ATS Maintenance - No. 1228 | 011 | 315 4391 | ops@atsheli.co.za | | • | | • | | | • | | • | | • | • | | | • | | • | | | • | • | | | |
| **RAND AIRPORT** | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Emperor Aviation - No 1266 | 082 | 497 1701 | paul@emperoraviation.co.za | | • | • | • | • | | • | • | • | • | • | • | • | • | • | • | • | | | • | | • | • | |
| **GRAND CENTRAL** | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Helimax Sales & Logistics- No 1285 | 082 | 376 0550 | lynette@helimax.co.za | | • | | | • | | | | | | | | | | | | • | | | | | | | |
| **LANSERIA AIRPORT** | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Interjet - No 080 | 011 | 701 3545 | lelani@interjet.aero | • | | • | | • | • | • | • | • | • | • | • | • | • | • | • | • | | | • | | | • | • |
| Gemair - No 1003 | 011 | 701 2653 | andries@gemair.co.za | • | | • | • | • | • | • | • | • | | • | | | | | | | | | | | | | |
| ExecuJet Aviation Group - No. 198 | +2711 | 516 2300 | maintenanceinfo@execujet.co.za | • | | • | | • | • | • | • | • | • | | • | • | • | • | • | • | | | • | | | | |
| Wellco Air Services - No. 119 | 011 | 6591933 | welcoair@netactive.co.za | • | | | • | | | | | | | | | | | | | • | • | | | | | | |
| AES - No. 1011 | 011 | 701-3200 | danie@aeroelectrical.co.za | | | • | | | | | | | | | | • | | | | | | | | | | | |
| **WONDERBOOM AIRPORT** | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 208 Aviation - No1148 | 083 | 820 4754 | marketing@208aviation.co.za | • | | | • | • | | | | | | | | | | | | • | | | | | | | |
| Integrated Avionic Solutions - No 0057 | 012 | 567 7312 | gert@iafrica.co.za | | | • | | | | | | | | | | • | | | | | | | • | | | | |
| Aero Engineering & Powerplant - No 227 | 012 | 543 0948 | nt.aep@iafrica.com | | | | • | | • | | | | | | • | | | | | | | | | | | | |
| Apco - No 12 | 012 | 543 0775 | tonyrodrigues@mweb.co.za | | | | • | | | | | | | | • | | • | | | • | • | | | | | | |
| Adventure Air - No 1192 | 082 | 803-0590 | w.bekker@venture-sa.co.za | | | | | | | | • | • | • | | | | | | | | | | | | | | |
| **DURBAN** | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Starlite Maintenance - No. 0824 | 031 | 511 6600 | wimpier@starliteaviation.co.za | | • | | • | | | • | • | • | | | | | | | | | | | | | | | |
| **CAPE TOWN** | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ExecuJet Aviation Group - No. 198 | +2751 | 934-5764 | maintenanceinfo@execujet.co.za | • | | • | | • | • | • | • | • | • | | • | • | • | • | • | • | | | • | | | | |
| AES - No. 1011 | 021 | 934 5373 | capetown@aeroelectrical.co.za | | | • | | | | | | | | | | • | | | | | | | | | | | |
| **MURTALA MUHAMMED INT. AIRPORT LAGOS, NIGERIA** | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ExecuJet Aviation Nigeria Ltd - No. 1273 | +2341 | 295 5110 | maintenanceinfo@execujet.com.ng | • | | • | | • | | • | | • | • | | | • | • | • | | • | | | • | | | | |

Twin Tecnam

# P2006T

## The perfect step-up to multi-engine flying

# P2006T SPECIFICATIONS

| | |
|---|---|
| Length: | 8.7 m |
| Height: | 2.85 m |
| Wingspan: | 11.4 m |
| Empty weight: | 800 kg |
| Max. take-off weight: | 1230 kg |
| Useful load: | 430 kg |
| Seating capacity: | 4 |
| Cruise speed: | 140 ktas (75%, 34 liters Mogas/Avgas per hour) |
| Range: | 742 nm |
| Take-off distance: | 490 m |
| Landing distance: | 320 m |
| Engines: | Rotax 912 S3 100hp |
| Manufacturer: | Tecnam Aircraft, Capua, Italy |

*Economical and good-looking, what more could we ask for? Note the emergency exit on top of the cabin*

## Light Twin reviewed

By Erik Brouwer

**Although the numbers have been promising from the start, it took over eight years for a flight training organisation in the Netherlands to see the light and purchase a Tecnam P2006T. Which is surprising, as the Tecnam P2006T is supposed to be the most economical light twin on the market. The perfect plane for regular Cessna-aviators to step-up to a multi-engine license? We strapped ourselves in to find out.**

On the platform, the appearance of the Tecnam P2006T closely resembles the Partenavia (now Vulcanair) P.68, with its high wing, big cabin and relatively high tail. This is no coincidence as both aircraft were designed by the same Luigi Pascale, although almost forty years apart.

Following Tecnam tradition, the P2006T is named after the year in which it was conceived exactly ten years ago. Before then, it was hard to believe that two 100hp-Rotax engines could deliver enough power to carry four persons and their failing counterpart by themselves in case of an engine failure. But Tecnam has proven it to be possible by using modern manufacturing techniques to create the lightest four-seat twin engine currently available on the market.

### Working space

The pilots and passenger get in the plane through separate doors, which gives the four-seat twin an airliner-appeal. Seats and legroom both in the front and in the back are very comfortable, and once you are in your seat there is plenty of headroom even for the tallest flying dutchmen.

Although the Tecnam P2006T does not come with the now almost standard Garmin G1000, it comes close with the optional non-integrated G950. Non-integrated meaning the autopilot (S-TEC) is not included but a separate assembly, and engine instruments also are mounted separately at the right side next to the Garmin 950 screens.

The Tecnam twin is controlled by a yoke and three sets of levers (throttle, propeller pitch, carb heat) which all make the cockpit an even more familiar place for Cessna pilots.

### Strapping in

The little Rotaxes are brought to life by switching on the fuel pumps, enabling choke and ignition and pushing the starter buttons located on the overhead panel. The first difference twin-newbies will notice is the lack of shaking and rattling that comes with starting a single engine aircraft, as the engines are now conveniently located outside of the fuselage. Taxiing is a very familiar feeling, with similar rudder forces and brake input required as many single engine aircraft. The aircraft rolls easily even on idle power, and is a bliss to taxi around even the smallest taxiways. This in stark contrast with the DA-42 we flew last year, which requires force to move the rudder and brakes, and is much heavier on the controls on all aspects. There are no special items in the before take-off checklist, but our attention is immediately drawn to the poorly designed flap switch. With

*Above: The trailing link landing gear is hydraulically operated and stowed away in a fairing and the fuselage*

*Above and Right: The passenger (left) and pilot door make for unparalleled easy access to the comfortable and roomy seats.*

three positions being up, neutral, down (and you have to hold it to extend the flaps to the required position), it is a lot of fuss to retract the flaps incrementally in case of a go-around or touch-and-go. The design was used in the 60's by Cessna as well, but Cessna replaced it with a more convenient multiple-position flap lever that is more set-and-forget. We can't figure out a reason for Tecnam to go back to this flawed design, as it increases work load at moments you need all the help you can get single-engine go-around for example.

## Stable platform

Once lined up on the runway the throttles are pushed forward, and the aircraft quickly accelerates while noise levels remain decently low. It is not hard to remain on the centerline,


*The Garmin 950 is the non-integrated version of the G1000, with engine instruments (right) and autopilot (top) installed separately.*


S-TEC
FIFTY FIVE X
HDG
NAV
APR
REV
ALT
VS
GARMIN
MAP - NAVIGATION MAP
PH-TWN
NO SMOKING
LH FUEL QTY. RH
MASTER SWITCHES
AMP.

By Erik Brouwer

and the aircraft sits stable on the ground until the very moment you pull the nose up. We establish a climb of about 850 feet per minute at 85 knots, after which the landing gear is retracted. The landing gear is hydraulically driven with a back-up pressure reservoir available, which can be used by opening a valve located right in front of the pilot seat. Once up in the air the aircraft shows no strange tendencies on any axis, but the rudder requires some getting used to. Because of the extremely light control forces required, one can easily give excessive rudder resulting in an uncoordinated turn. In cruise, the aircraft gives us about 130 knots consuming about 35 liters of Mogas per hour. There is no synchronissation help available, so synching the engines is eliminating the vibration of your seat by fiddling around with the prop levers.

The engine instruments, although analog and not incorporated in the Garmin 950, are easily readable and very precise but the parallax effect is present because of the location far to the right of the pilot seat.

## Single engine

It is time to test the almost unbelievable capability of the P2006T to stay airborne on a single Rotax 100hp, by pulling back the throttle of one engine. Here the light rudder control forces really help, as it is not hard to push the nose back into the direction of

flight, and keeping it there for a significant amount of time. Bringing the aircraft in with 50% flaps makes for a final approach speed of about 80 knots, after which the landing is uneventful and very Cessna-like. Flaring is easier thanks to the heavy engines being located closer to the center of gravity. •


*Above: The S-TEC 55X autopilot is not as convenient as a G1000 integrated version, but it has all the capabilities that you may expect.*

*Right: Throttle, propeller, carb heat. The Rotax engines do not require mixture control.*

*Left: The Rotax 912 S3 engines deliver 100hp each to a constant-speed propeller, consuming 17L of Mogas or Avgas. The TBO is 2000 hours.*


## Verdict

**With the P2006T, Tecnam has delivered a great training platform for pilots who want to gain their first experience with flying with more than one engine. Both the flying characteristics and operating costs make the P2006T by far the most convenient and accessible step-up from flying single-engine aircraft. Operating costs can be lower than 250 EUR per hour thanks to the unleaded fuel-sipping Rotaxes, whereas many alternatives on the market (Seneca, Twin Star) are all above 450 EUR. The P2006T is a comfortable cruiser too, thanks to its spacious cabin and two separate doors. But with it's retractable gear and two engines there are more economical single-engine alternatives available that have better performance and lower operating costs. For pilots who want to make the transition to multi-engine flying, it's hard to find a more appealing alternative to the P2006T. Well done, Tecnam!**

**Contact: Riaan van der Merwe, +27 83 654 6582, riaan@interjet.aero.**

# CALL US FOR PRICING!!!!!

## Are you still operating the Garmin GNS 530 and GNS 430 and you don't want to perform a Brand NEW upgrade?

We have a solution for you. Avidyne has released their Brand New IFD series GPS/NAV/COM system which is a drop-in replacement for the Garmin GNS 530 and 430 GPS/NAV/COM system.

The IFD series combine the best Flight Management System available in an easy-to-use, plug & play design. Each IFD provides VHF communication, Navigation, GPS and SBAS/LPV precision navigation. The system is designed to meet the accuracy and integrity requirements for ADS-B as part of the NextGen airspace initiative.

In addition to the dedicated knobs and buttons the IFD series Hybrid Touch capability allows you to perform virtually all of the same functions via the touch-screen interface or knob and buttons depending on phase of flight.



INTERJET

**www.interjet.aero**

By Charmaine de Villiers

# BLUECHIP FLIGHT SCHOOL

## Making a difference when it comes to training professional pilots

**To be able to fly is the dream of many and while this can easily be achieved by some, there are those who have to keep an eye on finances. Flight lessons are expensive hence the fact schools are turning to simulators in order to compliment the training of their student pilots**

One such is Blue Chip Flight School based at Wonderboom Airport near Pretoria and with 20 years of experience, they assure industry leading pilot training. The school installed a state of the art FSTD – A FNPT II Simulator that is designed and built to meet the SACAA technical requirements and beyond. Emergencies can be simulated from engine fire or engine failures to system failures or weather emergencies. It does not only cover local conditions and airfields but also covers most of the world and offers pilots the opportunity to fly in any country in real time.

Type specific to the Piper Seneca III, Piper Warrior and Piper Arrow, the simulator is built into a composite cockpit moulded from an original Piper Seneca fuselage.

This flight model is used to represent the multi-engine piston class aircraft. Although Blue Chip Flight School uses predominantly Cessna aircraft for ab initio training, instrumentation on the two types is similar with the result that the pupils have no problem switching between the two.

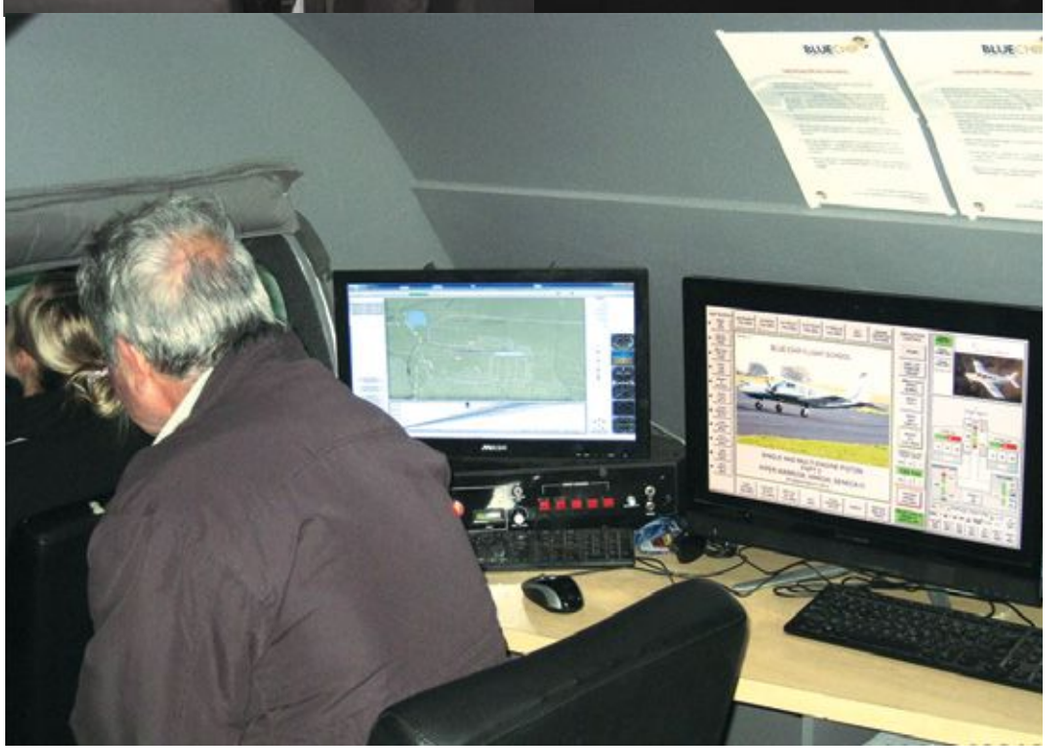
In addition, the FNPT II Simulator has two additional type specific flight models – the fixed pitch, fixed gear piston single engine Piper Warrior and the complex piston single engine Piper Arrow.

### The simulator also features:

- Autopilot with electric pitch trim
- HSI and FD
- Annunciator Panel
- Illuminated System Switches
- Hydraulic Toe Brakes
- Dynamic Control Loading
- 3-way Aviation Intercom
- 240˚ Direct Projection, Cylindrical Visual System
- Automated QTG System
- 2 LCD Screen Instructor Station
- 5 fully functional and remotely trippable Circuit Breakers
- Touchscreen controlled system failures.

### Flight models

There is no need for student or instructor to physically reconfigure the cockpit to switch between flight models. All that is required is the touch of a button and the flight model is changed, complete with re-configured type specific instruments on the instrument panel.



*Top 2 pics: Slowly turn to the left - too much and the aircraft can go into a spin!*

*Left: Aircraft type, scenery and conditions can all be altered by a press of a button on the computers to the right of the photo.*

# BLUECHIP
## FLIGHT SCHOOL
PRETORIA

PILOT TRAINING

## OUR PILOTS BECOME CAPTAINS

# Open Day
# 23 July 2016

# SIMULATOR
## HASSLE FREE LICENCE RENEWALS

1st Floor, Main Terminal Building, Wonderboom Airport, Pretoria, SA
Tel: +27 12 534 3050 | bluechip@bluechip-avia.co.za

**www.bluechipflightschool.co.za**

@BlueChipPilots BlueChipFlightSchool

By Charmaine de Villiers

Simulators hold a major advantage over actual aircraft flight time in that should the student experience any problems or want to clarify something, the simulator can be put on hold and the necessary adjustments or information given. Aircraft cannot be halted in midair.

## Benefits of Flight Simulators:

- The best flight simulator experience allows students to exercise and master specific flight conditions without leaving the ground.
- Training that takes place in a simulator is predictable without the interruption of unforeseen delays such a poor weather or mechanical difficulties.
- When comparing costs, aircraft simulator training can be more affordable than live flight time, saving costs for fuel, wear and tear and aircraft rental.
- Student safety is secured during flight simulations allowing student pilots to train under emergency conditions as well as bad weather and technical / mechanical failure.
- Flight simulators allow students in training the opportunity to practice until perfect, mastering technique and decision making and various stress factors during flight.

## The use of simulator provides the following

- 5 hours towards the initial PPL and Night rating (to be credited towards initial Instrument rating).
- 20 hours towards the initial Instrument rating
- 30 hours towards the ATPL
- 3 hours towards an Instrument rating in another category
- 5 hours of patter towards the initial GRIII Instructors rating

## Annual instrument revalidation check

- Aspects of the initial Instrument rating skills test that cannot be tested in an aircraft.
- Grade I and Grade II flight instructors revalidation flight test.
- 10 hours instrument time, including at least 5 instrument approach procedures and a missed approach required for revalidation of an instrument rating lapsed for more than 24 months.

You are welcome to bring your own Designated Examiner or make use of our own Designated Examiners, we invite everyone, pilot or aviation enthusiast to make use of our simulator 24/7.

There is no substitute for a personal visit, come and look at our equipment, talk to us. Better still talk to people in the aviation industry. Former Blue Chip students are everywhere in sought after positions in the aviation industry, nationally and internationally.

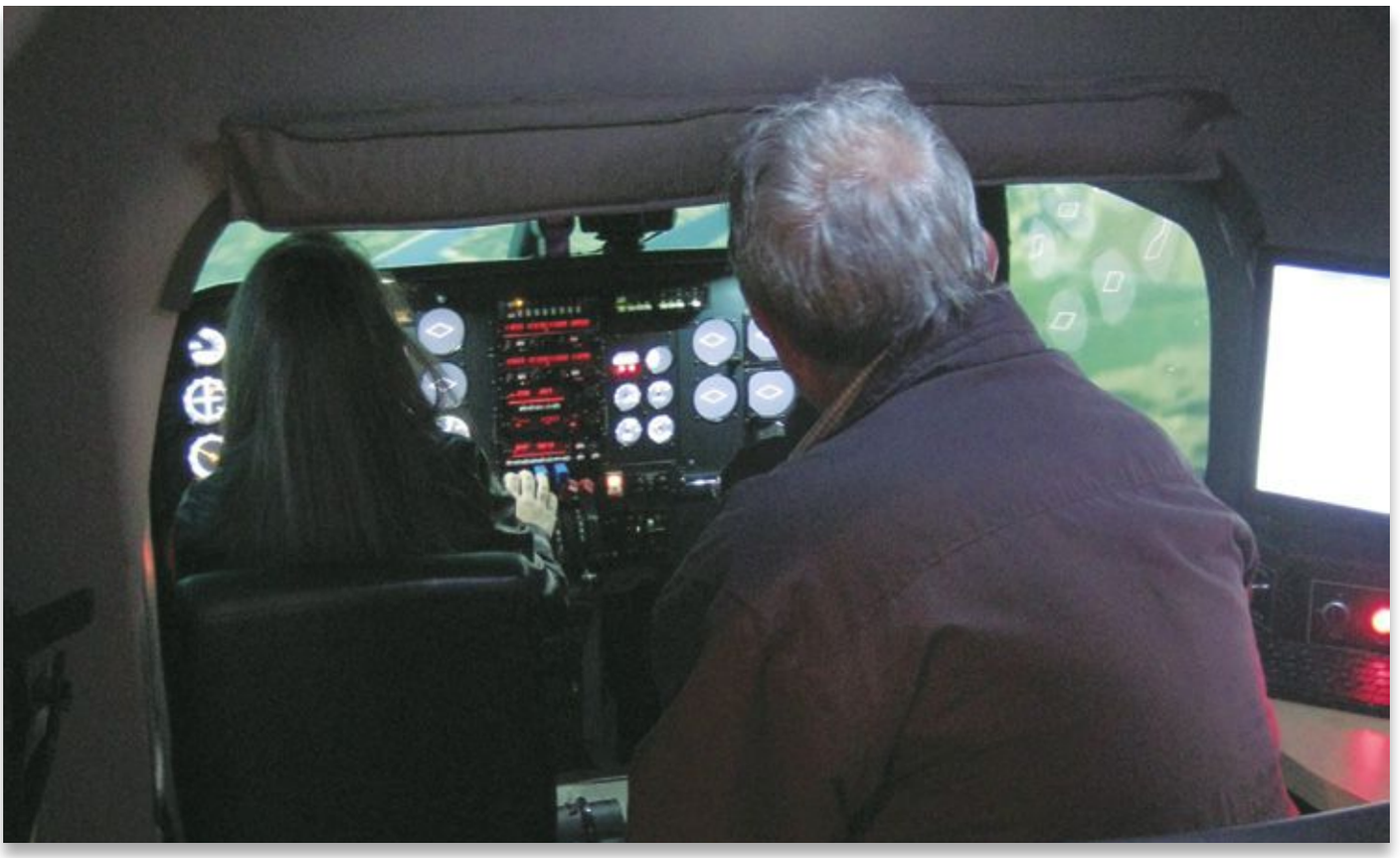
**Our next Open Day is 23rd July 2016**

Please Contact us:

**012 543 3050**

**bluechip@bluechip-avia.co.za**

**www.bluechipflightschool.co.za**



# NEWCASTLE AIRSHOW 2016

*Torre Pitts - Scully Levin and Arnie Menegehlli*


**On Saturday, 4 June, the skies above Newcastle played host to a myriad of dream-machines.**

It was a really early 0400 wake up call for me and my four photographer companions but it sure was worth the effort. On arrival in Newcastle we found perfect weather conditions and everything ready to go - well done to the Newcastle team!

The Newcastle Airshow, considered by many as one of the major airshows on the South African calendar, attracted fans from all over the province. This Airshow is one of few aviation events the South African Air Force identify as a show they partake in and they pulled out all the stops with a C130 BZ, team 80 Silver Falcons and an A109 helicopter in attendance.

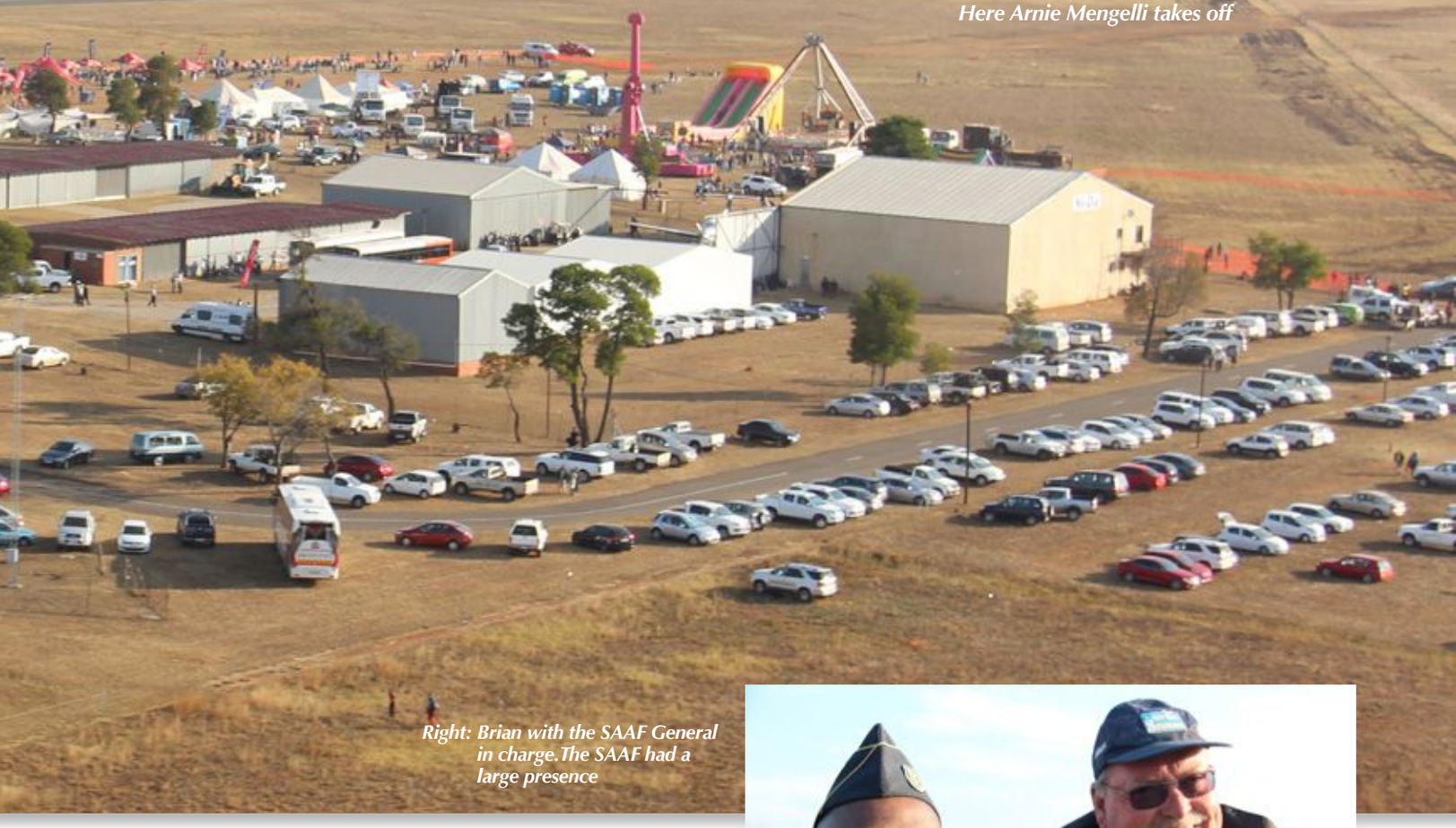
Champ Marketings Johan Pieters and Christo van der Vyfer had done a really good job and even went to the trouble of putting out a show newspaper which gave information on all the teams, the sponsors and aircraft flown. Brian Emmenis pulled out all the stops with the commentary and SAAF arrangements to help ensure the success of KZN's only airshow and succeeded once again as only he can do with a command performance - great music and sound which kept spectators informed.

It was great to see the

*Right: Leader of the Flying Lions Scully Levin compares notes with Major Mark Gentles leader of the Silver Falcons and above in action.*

*Impala under Mike Weingartz*

*The Harvards were decorated in Wonderboom Adreneline Airshow colours. Here Arnie Mengelli takes off*



*Right: Brian with the SAAF General in charge.The SAAF had a large presence*

SAAF in the form of the team 80 of the crack Silver Falcons in attendance under Major Mark Gentles with no 4 being flown by the new lady soloist Wendy Badenhorst.

Now to the other airshow performances themselves:

Nigel Hopkins Extra 330 LC – brilliant and early he has settled in to the new beast quickly.

Menno Parsons – Mustang Sally – this machine just has an amazing presence and thanks to Menno and Master Power for being there. Master Power Technologies owner Menno Parsons, one of the sponsors of this years' show, wowed the crowds with among others his P51 Mustang Sally and the Aero L-39 Albatross fighter jet under Captain Glen Warden.

Parachutists – great and they were taken aloft by the Heystacks being SA Express CRJ pilots in their Antonov An 2 which also gave a display.

Next up we had a beautiful gyro display.

Denel test pilot Mike Weingartz flew the Impala as only he can.

A stunning glider display with smoke was given by Gary White cross having been towed aloft by the Lambada under Derek Hopkins.

Rv Raptors – Pierre Gouws and the team really fly very tight and these machines were fresh from their 2 brilliant performances at the 28th May Sky GP.This time the no. 4 was none other than Nigel Hopkins in the new Extra 330 SC.

Pierre Gouws also teamed up with Comair pilot Glen Warden flying Menno Parsons in the L39 and the two of them

***Above: Scully Levin and Rodney Chinn both senior Mango Captains total age 140 years. Total flying hours logged more than 60000***


*Above: Mike Wright taking a few images of the crowd line from the SAAF A109 chopper - image Gerard Griessel*

*Right ?????*

gave a great tight display.

Torre Pitts Specials - This year we had Scully Levin and Arnie Meneghelli in two S2bs and the new black Pitts S2c owned by Arnie Meneghelli under Sean Thackwray. They also flew the 3 Adreniline Harvards to very good effect. The Flying Lions Harvards are presently looking for a sponsor so anyone interested please contact Scully Levin on flyboys@global.co.za. So come on folk lets get out there and try and help keeping the very special Harvard props turning.

Also flying were Neville Ferreira who gave a great shown in the Fuso Slick 540 and he raced a Stucky Motors flying Mercedes 63 AMG which really wowed the crowds. Ivan van der Schaar gave a display in his Pitts S2.

Denel Aviation put on a fantastic careers day – they have been a partner in this for the past five years and presented grade 11 pupils with an opportunity to visit this show free of charge and get some VIP treatment along the way. There were helicopter flips, hospitality tents and a great kiddies amusement park – something for everyone.

What a fantastic show which will remain in my memory banks for a very long time. Thanks go also to Airshow Boss Charlie Marais , Safety Director John Neilon and Ramp Director Peter Graham. We were treated to a beautiful berg sunset on the way home to Durban. My photographer colleagues Brian Spurr, Gary Sheppard Yens and Gerard Griessel agreed that it had been a great day and well worth the 700 km drive from Durban. Frankly who could ask for more and this is the only airshow in KZN for 2016. Talking about KZN airshows we are chatting to Airlink and Dr Clive Coetzee about a Pietermaritzburg airshow next year so watch this space. •

***Top:*** ***The SAAF C130 BZ gets a push!***

***Middle:*** ***Menno Parsons Mustang Sallly with crowd line***

***Left:*** ***Slick 540 vs Mercedes***

# LOOK INTO THE FUTURE

Saab's portfolio covers all domains and is supported by 60 years of radar development. Our world-class systems and services deliver efficient weapon detection, location and protection based on our extensive research, development and experience.

Saab is at the very forefront of radar technology and offers outstanding capabilities to demanding customers all over the world. In a way you could say that our mission in this field is to help your forces virtually look into the future. To see before you are seen and maintain superior situational awareness.

A line of ground-breaking innovations form a track-record that proves our ability to sharpen the **thinking edge**. Making it sharp enough to break through the barrier of the impossible, strengthening your ability to protect your troops and keep civilians safe.

www.saab.com/southafrica

SAAB

by Mike Wright BCom, LLB

# PITTS SPECIAL

## We look at its history and chatt to Team Torre aerobatic pilot Sean Thackwray about the S2C version

**The Pitts Special (company designations S1 and S2) is a series of light aerobatic biplanes designed by Curtis Pitts which has accumulated many competition wins since its first flight in 1944. The Pitts biplanes dominated world aerobatic competition in the 1960s and 1970s and, even today, remain a potent competition aircraft including here in South Africa.**

### Design and development

Curtis Pitts began the design of a single-seat aerobatic biplane in 1943–1944. The design has been refined continuously since the prototype's first flight in September 1944, however, the current Pitts S2 still remains quite close to the original in concept and in design.

Several of the aircraft that Curtis Pitts built had a picture of a skunk on them and were called "Stinkers". After she bought it, aerobatic performer Betty Skelton called the second aircraft that Curtis built, "Lil' Stinker". The prototype S-2, which was the first two-seat Pitts, was "Big Stinker", the prototype Model 11 (later called S1-11B) was "Super Stinker", and the prototype Model was the "Macho Stinker".

In 1962 Curtis Pitts set up Pitts Enterprises to sell plans of the S-1C to homebuilders.

### Current versions

Certified versions of the Pitts are now produced by Aviat aircraft in Afton Wyoming. It is available as the S1 single-seater with an up to 200 hp (150 kW) flat 4 Lycoming and a 17 ft 4 in (5.28 m) wingspan, or as the S2 two-seater variant featuring a 260 hp (194 kW) flat 6 Lycoming and a 20 ft (6.1 m) wingspan. Pitts Specials have been equipped with engines of up to 450 hp (338 kW).

Plans for the single-seat Pitts S1-S are also available from Aviat Aircraft. The S1-C and derivative S1-SS plans and kits are supplied by Steen Aero Lab in Palm Bay Florida. Many hundreds of homebuilders have successfully completed and flown the Pitts since plans became available in 1960.

### History

All single-seat (S-1) and two-seat (S-2) Pitts Specials are variations on the basic design from 1944.

The aircraft was popularized by Betty Skelton, Caro Bayley and other air show performers, which led to the offering of plans in 1962.

Pitts produced limited numbers of aircraft during the 1940s and 1950s. The Pitts Special became the standard by which all other aerobatic aircraft were judged. After a number of homebuilt aircraft were produced from rough hand-drawn plans produced by Pitts, more professionally drawn plans went on sale in 1962. While many homebuilt aircraft were built in the 1960s, earning the S1 a reputation as an excellent aerobatic aircraft, Pitts worked on the design of a two-seat aerobatic trainer version, the S-2, which first flew in 1967 and gained its type certificate in 1971. Factory-built aircraft produced by the Aerotek company at Afton, Wyoming were joined in production by the single-seat S-1S in 1973.

The design's popularity grew significantly following Bob Herendeen's participation on the USA Aerobatic Team in a Pitts Special in the World Aerobatic Competition in Moscow, Russia in 1966.

In 1972, the US Aerobatic Team won the World Championships flying only Pitts biplanes.

In 1977 Curtis Pitts sold his interests in the Pitts S1 & S2 to Doyle Child. Child later sold the rights in 1981 to Frank Christensen, who continued production at the Afton plant under the guise of Christen Industries. The rights for homebuilt versions of the Pitts were sold in 1994 to Steen Aero lab, with the Afton factory and production rights being transferred to Aviat.

Curtis Pitts died in 2005 at age 89. At the time of his death, he was working with Steen on the prototype of the new Pitts Model 14, a brand new, two-seat biplane designed for unlimited aerobatics powered by the 400 hp Venyedev M14p radial engine. The rights to the Pitts name is currently owned by Aviat which also owns the similar model to the Pitts in the Christen eagle.

The current inverted flat spin world record is 98 set on 20 March, 2016 by air show performer Spencer Suderman over Yuma Arizona. Suderman flew the Sunbird S-1x, a Lycoming IO -540-powered experimental variant of the Pitts S1. The manoeuvre began from 24,500' over the Yuma Proving Grounds and was recovered at 2,000' AGL. The previous world record for the number of consecutive turns in a flat spin was 81 also set by Spencer Suderman on 13 March, 2014 in a Pitts S2-B from 23,000 ft altitude over the Naval Air Facility El Centro.

### Different Pitts Models

S-1 Basic single-seat Pitts aerobatic biplane with a flat M6 aerofoil section and lower wing ailerons only, fitted with a variety of engines. Two were built, the first named Special and the second Li'l Stinker.

S-1C Amateur-built S-1 single-seat aircraft, flat bottom wing with ailerons on lower wing only, designed for 100–180 hp (75–134 kW) engines. First flown in 1960, the S-1 is currently available as a plans – built aircraft from Steen Aero Lab.

S-1D Amateur-built S-1C with ailerons on all four wings, generally similar to S-1S.

S-1E Amateur-built S-1C using factory-produced kits. Uses symmetrical airfoil.

S-1F Outside derivative homebuilt, with the Falcon wing. Square tips, 25% more aileron span. In the UK, this model is fitted with a 200 hp (149 kW) Monty Barrett engine, and a lightweight Hoffmann VP propeller.

S-1S Aerotek-built certified S-1C for competition aerobatics, round airfoil section, four ailerons and powered by a 180 hp (134 kW) Kycoming EEIO -360-B4A; 61 built. This model is also available from Aviate aircraft as a plans–built aircraft.

S1-SS Similar to the certified S1-S "Roundwing". 180–200+ hp (134–149 kW), single-seat, homebuilt, symmetrical wing, four symmetrical "Super-Stinker" style ailerons, 300 degree/s roll rate, fixed-pitch propeller. This model is available in plans and components form from Steen Aero Lab.

S-1Tts Aerotek-built S-1C with a 200 hp (149 kW) Lycoming EEIO-360-a1e and minor changes; 64 built. Four-aileron, single-seat, factory-built, symmetrical wing, symmetrical ailerons, constant speed two- or three-blade Hartzell propeller. The top wing was moved forward compared to the S-1S for weight and balance. This model was in production in 2008 from Aviat Aircraft as an "on-demand" manufacture product.

Sl-l1B Known as Model 11 "Super Stinker", 300+ hp (220 kW) Lycoming, four-aileron, single-seat, experimental-plans or factory-built and factory component parts, symmetrical airfoil, three-blade constant speed prop, rolls better than 300 degree/s, climbs better than 3,000 ft/min (15.3 m/s).

S-2 Scaled up S-1 with tandem two-seat fuselage and powered by a 200 hp (149 kW) Lycoming AEIO-360-B4A engine.

S-2A Aerotek-built S-2A with a 200 hp (149 kW) Kycoming AEIO – 360 AS1a or -A1E piston engine, constant speed prop, later builds has a longer landing gear and a 2-inch-wider (51 mm) front cockpit; 259 built.

S-2B Aerotek-built S-2A with a

*Arnie Meneghellis new Pitts S2C presently being flown by Sean Thackwray as team Torre soloist*


260 hp (194 kW) Lycoming AEIO o 540-d4a5 engine, and upper wing auxiliary fuel tank, the landing gear and upper wings were moved forward six inches; 196 built. The aircraft is out of production but is supported by Aviat Aircraft. The Torre aerobatic team have two S2bs which are flown by leader Scully Levin and also Ellis Levin.

S-2C Four aileron, two-seat, factory-built, symmetric airfoil, 260 hp (194 kW) Lycoming driving constant speed three-blade propeller, current production model. This was an evolution of the S-2B model, with improved ailerons and rudder, flat bottom fuselage, lower profile bungee gear, better inverted handling and certified for +6 -5g. It is in production in 2008 by Aviat Aircraft.

S-2E Amateur-built S-2A from factory-produced kits.

S-2S Aerotek-built S-2B with a single cockpit and a twin tank fuel system. The fuselage is shortened by 14 inches (35 cm) forward of the cockpit to allow the installation of the heavier 260 hp (194 kW) Lycoming AEIO 540 d4a5. The wingspan is 20 ft, 0 inches (6.10 m); 17 built. This model is currently out of production, but supported by Aviat Aircraft. Team Torre's Arnie Meneghelli flies one of these aircraft

S-2SE Amateur-built S-2S from factory-produced kits.

## PITTS S2C – SEAN THACKWRAY

We now have a look at the S2c version with Torre aerobatic team pilot Sean Thackwray having chatted to him at the recent Newcastle Airshow:

"I am just a normal Captain on the Airbus 320/319 fleet (strange how I went from senior F/O on 340's to senior Captain in various magazines etc!). I have a total of around 16 500 hours of which not nearly enough are aerobatic hours (I don't log aerobatics separately). I flew my first display with the Lions in October 2010 so I am, relatively speaking, a newbie on the team. I fly as the solo (no.4) in the Harvard and as no.3 in Team Torre. When required however, I get to fly as a stand in solo for Team Torre.

My first experience of the C was in the USA, when I did an advanced spin training course with the amazing Bill Finagin. Bill is an airshow pilot and an advanced aerobatics and spin training instructor based in Annapolis. His choice of aircraft is the S2C. Since Arnie Meneghelli bought the only S2C currently in South Africa, I have had three opportunities to display the aircraft. I must add that I barely feel qualified to talk on the subject except for sheer enthusiasm! I fly a very basic repertoire and haven't yet ventured into the realm that the aircraft is capable of. Ellis Levin is our regular Pitts solo performer, and has already started opening up the envelope of his display. It is worth coming to an air show just to watch him displaying the aircraft he has declared the finest he has flown to date.

In essence, the S2C is a step up in the evolution of the Pitts Special, and as close as dammit to perfection. In comparison to the S2B on which I cut my Pitts teeth, the C has a number of improvements. The most visually obvious change is the squared off shape of the elevators and rudder, as well as the aerodynamic balance horns that go with them. The wing tip shape is also modernised, as are the ailerons - resulting in a higher roll rate. The cowling is slicker, the belly flatter and the windshield is easier to see out of. The undercarriage and bungee system have been improved making it easier to taxi and theoretically easier to land! It still has a 260 HP Lycoming engine, but very noticeably a three bladed Hartzell propellor that really changes the experience. I am absolutely smitten with the aircraft. It feels a bit like an Extra 300, and even a Zlin 50 morphed into the classic airframe that is truly a Pitts "Special". Scully often poses the rhetorical question of what does one replace a Pitts Special with for an aerobatic team? The answer is "another Pitts Special" of course!

In as far as what it is like to fly in our team, I could write reams but won't. It is a very special privilege to fly with Scully, Arnie and Ellis. Our team thrives on professionalism, loyalty, trust, a sense of humour and a passion for aerobatics. Being able to read each other's minds helps too!

If you don't mind, that is where I would like to leave it." •

### GENERAL CHARACTERISTICS

| | |
|---|---|
| Crew: | One |
| Capacity: | One passenger |
| Length: | 18 ft 9 in (5.71 m) |
| Wingspan: | 20 ft 0 in (6.10 m) |
| Height: | 6 ft 7½in (2.02 m) |
| Wing area: | 125 ft² (11.6 m²) |
| Empty weight: | 1,150 lb (521 kg) |
| MTOW: | 1,625 lb (737 kg) |
| Engine: | 1 × Textron Lycoming-D4A5 flat-six air cooled piston engine, 260 hp (194 kW) |

### PERFORMANCE

| | |
|---|---|
| Vne: | 182 knots (210 mph, 338 km/h) |
| Cruse speed: | 152 knots (175 mph, 282 km/h) (max cruise) |
| Stall: | 52 knots (60 mph, 97 km/h) |
| Range: | 277 NM (319 mi, 513 km) |
| Ceiling: | 21,000 ft (6,400 m) |
| Rate of climb: | 2,700 ft/min (13.7 m/s) |
| Wing loading: | 13.0 lb/ft² (63.6 kg/m²) |
| Power to mass: | 0.16 hp/lb (0.26 kW/kg) |


*Left: Arnie Meneghellis single seat P58*

# AFRICA'S PREMIER EXHIBITION OF AIR, SEA & LAND TECHNOLOGIES

## 2016 AT A GLANCE

**THE LARGEST**
Aerospace & Defence Exhibition in Africa

A display of the world's air, sea and land technologies

Youth Development Programme attracting young people to the aerospace & defence industry

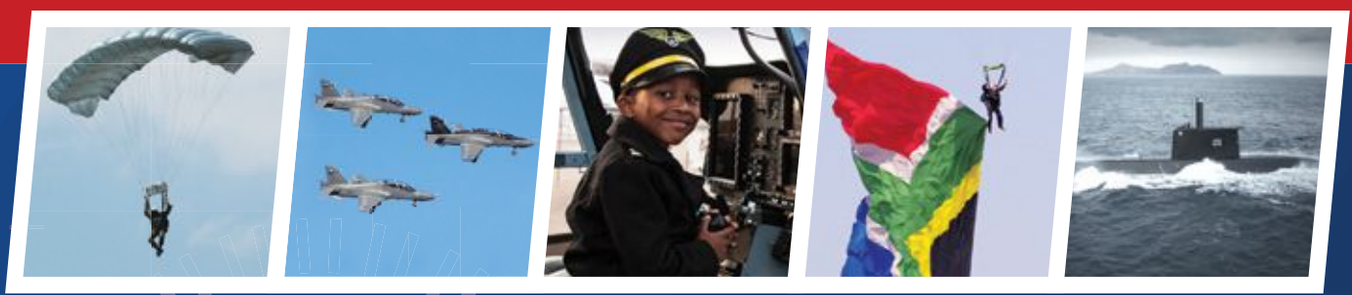
**46 000 sqm**
Indoor and outdoor exhibition space

**DELEGATION PROFILE**
Ministers
Secretaries for Defence
Chiefs of Armed Forces
Chiefs of Armies
Chiefs of Air Forces
Chiefs of Navies
Acquisition and Procurement Officials

Dedicated media centre with media from all over the world

Civil & Military Aircrafts on Static Display

National Pavillions
Comprising of countries and government departments



# AAD2016

**14 - 18 SEPT 2016**
**WATERKLOOF AIR FORCE BASE**
**CENTURION, PRETORIA**

## UNLOCKING AFRICA'S AEROSPACE AND DEFENCE POTENTIAL

**www.aadexpo.co.za**

**OUR PARTNERS:**

## Saving the Day

by Mike Wright BCom, LLB

# Engine failure along the coast

It was beautiful sunny morning up the Kzn North Coast and I was very excited about flying my new microlight for the first time.

This was an electric start Rotax 503 powered Aquilla 2 model having belonged to an instructor previously and had a new engine with less than 100 hours on it

After going through a very careful rigging process done by the book (have the manual with you) I checked everything and got ready for her first flight

Regarding the pre flight inspection I cannot over emphasize how careful one has to be here. Segment the plane into slices of bread and go through every component carefully before moving on to the next item. Use a small torch if need be.

There must be no cell phone calls received or made or other potential distractions during the rigging process and subsequent major pre flight inspection.

Finally ready for flight and I taxied over to the AMOs hanger to request a few colleagues to double check me on the rigging and so on.

It should be stressed that I had already warmed the plane up carefully.

Once this was complete I restarted and of did another warm up.

I then taxied to the threshold of the active runway and performed the pre flight checks again being careful that the engine was up to temperature.

I took off eventually and had just turned left crow wind at about 300 ft when the engine without any warning whatsoever quit on me.

***Mike and his grandson Matt enjoying the Aquilla trike together over Ballito***

No time for panic now. I figured it was just possible to get back to the runway for a downwind landing – I could not fly a circuit .

The first thing to do here always is to fly the plane. No time to attempt a restart – radio call and checked for traffic in the circuit.

Control bar in to best glide position (fly regularly and bond with your machine – that way you will know where the optimum positions are), establish the glide and then start looking for a place to put down hopefully clear of power lines and other obstacles. This is a critical moment because committed to your chosen landing site with no engine power you are committed. No energy to change the plan so make very sure the chosen sight is the best one available. In fact my view is to always fly defensively at all times looking out for a place to put down should the worst happen.

It should be noted that the stall speed of this plane is a low 33 mph so all goes well there should be no injuries and the wing loading is low as well.

Back to the event: I was now at right angles to the runway and figured that was going to need everything I had to avoid the wind sock and make it back onto the runway. Fortunately there was little wind.

Agonising seconds passed and I gently manipulated the bar so as keep the speed up but not lose the precious little height I had left. Feel what the wing is doing – fly the plane.

Well I duly arrived in the runway in a cloud of dust but gently fortunately!

I thank my instructor Craig Couzens for very good ab initio emergency training given and also Dave Jackson for the thorough license renewal test he puts me through every second year.

I had to have the engine completely stripped down and the AMO found that the stoppage was as a result of a cold seizure. Folk be very wary of this. He said that unbeknown to me the engine had not been run for some time under the previous owner and the crank

case seals had hardened as a result.

So if you buy a second hand trike make sure you cause the seller to make a full disclosure. Do not tolerate lost log books and the like. Get everything and scrutinise it very carefully.

Make sure your fuel containers are clean and that your fuel filter is secured preferably to the pylon and that the fuel filter is clean and unobstructed. Check for water in the fuel tank. Get into those hard to get to places. Keep the trike and engine clean and use a cover.

## ENGINE OUT 2

On another occasion after I had had the engine overhauled following the cold seizure I was performing a touch and go and in the climb at 50 feet going North and nearing the end of the runway when the engine quit.

No time for a restart and no chance of turning back – just enough energy. So what I had to do was side slip vigorously and try and get the machine down and stopped with less than 50m of runway remaining. Impossible!

I got it down fast and pulled the bar hard into my stomach so as to try and glue the machine to the ground for braking purposes. So did I get it down and stopped in time. Well nearly. Just ran off the runway into the cane unfortunately.

Lessons learnt – expect the unexpected. Be ready for any emergency and stay calm. If you get tense you are asking for a mistake. Do not turn back unless you are sure you have adequate height and energy – you will end up spinning in. Land 20-30 degrees off your centre line if need be.

In regard to emergency landing sites – avoid power lines or trenches and other obstacles when you can. In the case of a ploughed field in the direction of the ploughing into the wind if you can.

Do make sure that your ATF is always current and if your AMO specifies recommended work to be done get it done without hesitation and not just the work needed to get the legal ATF.

Aviation of course is basically safe but not at all forgiving of any carelessness, neglect or in attention so give it the respect and attention it deserves at all times. •

# South African Register

## NEW REGISTRATIONS

### ZS-REGISTRATIONS

| Registration | Date | Owner | Aircraft | Model | Serial Number |
|---|---|---|---|---|---|
| ZS-TGK | 20160425 | Prive Owner | CESSNA AIRCRAFT COMPANY | 210B | 21058000 |
| ZS-CCT | 20160503 | CDC AVIATION (PTY) LTD | CIRRUS DESIGN CORPORATION | SR20 | 2314 |

### ZT-REGISTRATIONS

| Registration | Date | Owner | Aircraft | Model | Serial Number |
|---|---|---|---|---|---|
| ZT-RAX | 20160426 | SA RED CROSS AIR MERCY SERVICE TRUST | AGUSTA S.P.A | AW119MKII | 14843 |
| ZT-RTF | 20160426 | VESTA CAPITAL (PTY) LTD | ROBINSON HELICOPTER COMPANY | R44 II | 13863 |
| ZT-RSR | 20160428 | SIBANYE GOLD LTD | BELL HELICOPTER TEXTRON | 407 | 54646 |
| ZT-RTG | 20160428 | BLUE NIGHTINGALE TRADING 129 CC | BELL HELICOPTER TEXTRON | 407 | 54647 |
| ZT-TMJ | 20160503 | HENNJEAN PEST CONTROL SERVICE CC | DJI | PHANTOM 3 ADVANCED | P76DDC15B27102 |
| ZT-TMI | 20160503 | INNOVATIVE SURVEYING SOLUTIONS (PTY) LTD | AERIAL KOPTER SOLUTIONS | Y-6 KOPTER MK III | AKSm20008 |
| ZT-TMK | 20160504 | PREMIER AVIATION CC | DJI | F550 | PA-MR-001 |
| ZT-TML | 20160504 | UAV INDUSTRIES (PTY) LTD | DJI | PHANTOM 4 | 07DDD490A10554 |
| ZT-TMM | 20160504 | UAV INDUSTRIES (PTY) LTD | DJI | INSPIRE 1 | W13DCE26041993 |
| ZT-THT | 20160506 | UAV INDUSTRIES (PTY) LTD | HOBBY CENTRE | X6 | ARM1202 |
| ZT-THH | 20160506 | UAV INDUSTRIES (PTY) LTD | AEROBOTICS | AEROHAWK | AH001 |
| ZT-THU | 20160506 | UAV INDUSTRIES (PTY) LTD | DJI | INSPIRE 1 | W13DCE05031128 |
| ZT-THG | 20160506 | UAV INDUSTRIES (PTY) LTD | HOBBY CENTRE | TAROT 4 | ARM1201 |
| ZT-TMN | 20160509 | TRADESTUFF 2117 CC | SENSEFLY | EBEE | EB-03-843 |
| ZT-TMO | 20160509 | TRADESTUFF 2117 CC | DJI | PHANTOM 3 PROFESSIONAL | SS3-WM3231503 |
| ZT-TLH | 20160512 | YOU THERE PRODUCTIONS CC | DJI | INSPIRE 1 | W13DCB1502022 |
| ZT-RAY | 20160512 | ALCARAZ FAMILY TRUST | ROBINSON HELICOPTER COMPANY | R44 II | 13918 |
| ZT-TMR | 20160513 | TIMESLICE CINEMATOGRAPHY (PTY) L TD | FREEFLY SYSTEMS | ALTA 8 | 765951 |
| ZT-RBD | 20160518 | BUSHVELD GAME CAPTURE CC | ROBINSON HELICOPTER COMPANY | R44 II | 13930 |
| ZT-RBG | 20160818 | BUSHVELD GAME CAPTURE CC | ROBINSON HELICOPTER COMPANY | R44 II | 13975 |
| ZT-RAZ | 20160519 | MIKE ROSS SAFARIS CC | ROBINSON HELICOPTER COMPANY | R44 | 2000 |
| ZT-TMS | 20160519 | CCD TECHNOLOGIES (PTY) LTD | DJI | INSPIRE 1 PRO | W21ADB24020437 |
| ZT-TMT | 20160525 | M Z SAFARIS CC | DJI TECHNOLOGIES CO LTD | PV331 | PH645514605 |
| ZT-TMU | 20160525 | CIVAIR HELICOPTERS AND EROPLANES (PTY) LTD | DJI | PHANTOM 3 | P77DCI19010527 |
| ZT-TMV | 20160526 | SNAP DEVELOPMENT (PTY) LTD | DJI | PHANTOM 4 | 11805A-WM3301512 |

### ZU-REGISTRATIONS

| Registration | Date | Owner | Aircraft | Model | Serial Number |
|---|---|---|---|---|---|
| ZU-ILG | 20160428 | Private Owner | WHISPER AIRCRAFT | WHISPER X 350 | WA15066 |
| ZU-MEE | 20160503 | Private Owner | VAN'S AIRCRAFT INC | RV 10 | 41512 |
| ZU-WKH | 20160429 | K H PLANT (WYNBERG) CC | FOCKE WULF/WERNER HAIML | FOCKE WULF FWP 149D | 160 |
| ZU-RLV | 20160504 | Private Owner | WAGTAIL GYROPLANE | TROJAN | 1313 |
| ZU-IIR | 20160509 | ABMANE INVESTMENTS (PTY) LTD | PERFORMANCE COMPOSITE AIRCRAFT | PCAD 700 TP | PCAD0001 |
| ZU-RGR | 20160513 | SHELDRAKE GAME RANCH CC | MAGNI GYRO | M-24 ORION | 24169574 |
| ZU-IIS | 20160518 | Private Owner | VAN'S AIRCRAFT INC | RV14 A | 140233 |
| ZU-TTV | 20160524 | Private Owner | VAN'S AIRCRAFT INC | RV-7 | 74380 |
| ZU-TCC | 20160524 | Private Owner | WHISPER AIRCRAFT | WHISPER X 350 | WA11061 |
| ZU-IIT | 20160526 | OVER-EASY CC | THE AIRPLANE FACTORY (PTY) LTD | SLING 4 | 089 |
| ZU-IIV | 20160526 | BUSHCAT PARTNERSHIP | RAINBOW SKYREACH (PTY) LTD | CHEETAH XLS | CH166C |

## EXPORTED

### ZS-REGISTRATIONS

| Registration | Date | Owner | Aircraft | Model | Serial Number | Country Exported to |
|---|---|---|---|---|---|---|
| ZS-HOD | 20120801 | FALCON LEASING (PTY) LTD | EUROCOPTER | EC 130 B4 | 3536 | KENYA |
| ZS-HIZ | 20130524 | CHOPPER WORX (PTY) LTD | EUROCOPTER | AS 350 B3 | 4333 | EGYPT |
| ZS-OTT | 20010710 | WARNE AVIATION (PTY) LTD | REIMS AVIATION | REIMS/CESSNA FR406 | 0040 | NAMIBIA |
| ZS-CHR | 20141002 | AWESOME FLIGHT LOGISTICS (PTY) LTD | RAYTHEON AIRCRAFT COMPANY | BEECH 1900D | UE-4 | AUSTRALIA |
| ZS-CFA | 20070627 | NATIONAL AIRWAYS CORPORATION (PTY) LTD | RAYTHEON CORPORATE JET INC | BAE.125 SERIES 1000A | 259024 | UNITED STATES |
| ZS-AFM | 2010622 | MAGIC BUILDERS CENTRE (PTY) LTD | CIRRUS DESIGN CORPORATION | SR22 | 3527 | UNITED STATES |
| ZS-CMD | 20140821 | CEM AIR (PTY) LTD | BOMBADIER | CL600-2B19 | 7141 | ZAMBIA |
| ZS-HXT | 20130802 | DE JAGER C | MD HELICOPTERS INC | 369E | 0616E | UNITED STATES |
| ZS-AMA | 20080822 | D LUND FARMS (PTY) LTD | CESSNA AIRCRAFT COMPANY | 208B | 208B-2022 | BOTSWANA |

### ZS-REGISTRATIONS

| Registration | Date | Owner | Aircraft | Model | Serial Number | Country Exported to |
|---|---|---|---|---|---|---|
| ZU-IGO | 20150807 | SIPPEL J J | KITPLANES FOR AFRICA (PTY) LTD | SAFARI LSA | 016-11-12-SAF | UNITED STATES |
| ZU-FTX | 20120802 | BROWN J E | THE AIRPLANE FACTORY (PTY) LTD | SLING LSA | 070 | AUSTRALIA |

FTS

Flight Training Services

# THE NEXT GENERATION OF PILOT & FLIGHT CREW TRAINING

## WE OFFER:

Flight Training from Private Pilot to Airline Transport Pilot

•

Multi Engine Class Ratings

•

Accredited PPL Examinations Test Centre

English Proficiency

•

Company Owned Accommodation & Transport

Please contact FTS for PPL & CPL ground school lecture bookings.


1st Floor
Main Terminal Building,
Grand Central Airport,
Midrand, South Africa

TEL: 011 805 9015/6
E-MAIL: fly@fts.co.za
WEBSITE: www.fts.co.za

by Dr Guy Gratton

# Navigation before GPS

**Pilots like the Wright brothers had no real problem knowing where they were, as they probably never flew out of sight of their take-off field. That was easy navigationally, but clearly wasn't going to last.**

Towards the first world war, aeroplanes started travelling. In 1909 Louis Bleriot crossed the English Channel in his model XI, and by 1918 there were numerous types capable of flying over 100mph and with a range over 300 miles. This created obvious issues – how does the pilot of an aeroplane know where they are at any given time? You can do a certain amount of following roads, rivers and railways (known colloquially as "IFR" or I Follow Roads), but crossing an ocean, a large area of indistinct or poorly mapped terrain, or just above cloud this approach is no good at-all. In 1922 the Royal Air Force ploughed a furrow 6ft wide the 500 miles from Amman to Baghdad across the Jordanian desert, and for a few years that really was the way aircraft really were being navigated on that route (still an airline route today, although the furrow is long gone).

More generally useful a compass and clock, and the invention of "dead reckoning": sometimes written as ded (or deduced) reckoning. The principle of ded-reckoning is straightforward – know which way you're pointing and how fast you're going, start the stopwatch and after (distance / speed) hours have elapsed, you should be where you wanted to go. Of course, it isn't really that simple, as aeroplanes won't fly at exactly the speed you think, and wind forecasts aren't perfect. You could start a flight by flying and timing between two fixed points, and from the difference between heading and track work out the wind; then, so long as the wind didn't change all that much en-route, you could use that value to correct your course. Charles Lindbergh did just that in the Spirit of St Louis in 1927, starting off by following the coastline to give him his corrections before he set out across the Atlantic on his way to Paris.

*Cockpit of my AA5 showing (1) ADF, (2) VOR (with an ILS), (3) VOR, (4) DME*

The use of bombing during WW2 created a greater need for highly accurate navigation out of sight of the ground, over long distances, where the enemy were unhelpfully reluctant for some reason to provide accurate meteorological data or ensure that towns underneath were well marked and lit up at night. So particularly the Germans developed the concept of "tracking beams". In 1939 two transmitters called Knickebein were built transmitting two narrow radio beams at a point in Britain which bombers could intercept knowing that when they crossed they were over the target. The British codenamed the system headache and started jamming it (with a project logically codenamed aspirin) – but it was the start of effective radio navigation. The principle was simple – two narrow adjacent beam with a phase shift across the width of the double beam allowing aircraft to constantly correct back into the beam, which (when not being jammed!) worked extremely well.

Post WW2 civil aviation went for something that actually was a lot simpler initially than Knickebein and its subsequent developments, which was ADF or Automatic Direction Finder. The technology was not at-all new – it had been used, especially for intelligence purposes (such as finding a U-boat or spy when they're transmitting) since WW1, but after WW2 airborne sets were increasingly used for navigation.

Very simply if you know the location of a radio transmitter (called a Non Directional Beacon, or NDB) then an ADF built into an aeroplane can tell you how many degrees left or right of the nose that beacon is. It's then a theoretically simple bit of maths to add that to the aircraft heading using the compass, backtrack from the known position of the beacon and you have a line on the map along which the aeroplane must be. Do that for a second beacon and where the lines cross is where the aeroplane is. Of course – it's really not that easy as a human being in the aeroplane has to do those calculations and if there's only a single receiver factor in the fact that the aeroplane will have moved between readings. That's tough for a navigator at his station in a 1950s airliner, and much tougher again for anybody who is trying to fly the aeroplane at the same time – whilst they're still in use, it would be fair to say that few modern pilots enjoy using ADF.

So an improved system was VOR, or VHF Omnidirectional Ranging – this goes back much closer to the principles of the German Knickebein system – an aircraft receiving the signal from a specialist groundbased transmitter can show the line from the transmitter that the aeroplane is on. That's great – no calculations based upon heading, and with two VOR receivers in the cockpit, the radials can be known at the same time, and the aeroplane's position plotted on the chart directly. However, it still needs some plotting, two beacons, and two receivers in the cockpit.

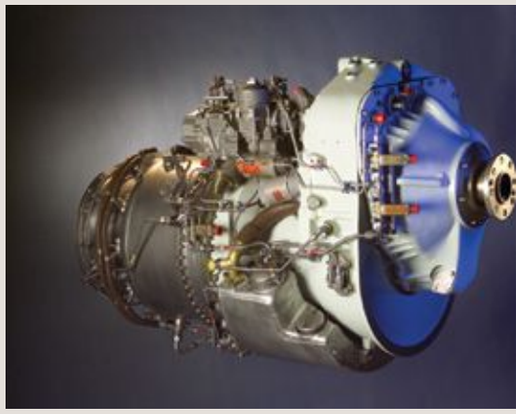
An enhancement of that was the introduction of DME, or Distance Measuring Equipment. DME was developed in Australia in the 1950s and relies basically upon accurate timing of electronic signals. The aeroplane transmits a coded signal, this is received and re-transmitted by a station on the ground – the aeroplane then receiving it. By automatically measuring the time between transmit and receive, and knowing the speed of radio wave propogation and the processing interval at the ground station, the receiver can work out and display the distance from the ground station. It's pretty good, generally accurate to about a tenth of a mile, although you need to correct for altitude.

With a couple of DME transmitters (called DME/DME) you can work out which of two positions the aeroplane is at – it's the two points where the circles of that distance meet each other, and with three you know where you are very accurately. Much more useful however is to co-locate the DME ground station with the VOR groundstation –with VOR/DME you can work out where you are as it's that distance along the measured bearing from the groundstation. Thus with a ruler and protractor (and most pilots own a little device called a VOR plotter that combines the two) you know where you are quickly and easily. VOR/DME is a super system and up until the 1980s it was the state of the art in airborne positioning.

Then in the 1980s the American government changed the game by launching a system of satellites called GPS or Global Positioning System. That I'll talk about another day. •

**TFE731**

Honeywell Authorised TFE731 Major Repair Facility
On Wing Test Data Acquisition
TFE731 -2/3/5 Repairs; MPIs
TFE731 -20/40/50/60 Repairs; MPIs
MSP / JSSI
On Wing Fan Balance / Vibration Survey



**TPE331**

Honeywell Authorised TPE331 overhaul Facility
Honeywell Authorised Test Cell
TPE331 series Repairs; H.S.I.s; GBI and Overhauls
TPE331 -14 GR/HR Repairs; H.S.I.s and CAMs

# ENGINE MAINTENANCE CAPABILITIES

ExecuJet specialises in the support of the Honeywell TFE731 and TPE331 series engines. As the only appointed major and heavy (TPE331) service centre on the African continent for these engines, our customer base extends well beyond South Africa's borders. With a fully equipped workshop and factory trained engineers, ExecuJet is capable of deploying multiple teams simultaneously to effect repairs in the field without compromising on scheduled shop functions. We are proud of our quick turn around times and after sales support.
Contact us today to see how we can assist your business.

Africa Paul Ludick, Tel.: +27 11 516 2472, paul.ludick@execujet.co.za www.execujet.com

Honeywell

Aircraft Management
Charter
FBO
Maintenance

ExecuJet
LUXAVIATION CMI GROUP

AFRICA ASIA AUSTRALASIA EUROPE LATIN AMERICA MIDDLE EAST

# Underwater Weapons, Anti-submarine Missiles, Rocket-propelled Depth Charges, Torpedoes and Sea Mines

**Russia's special exporter Rosoboronexport is a leading player in the naval equipment market in the world. The navies successfully operate Russian ships and submarines. At the same time demand is getting higher for systems and weapons compatible with ships built in countries other than Russia. Particularly it is true for a wide range of underwater weapons, including anti-submarine missiles, rocket-propelled depth charges, torpedoes and sea mines.**

The following ship-based underwater weapons possess great export potential: the 533mm DTA-53 twin torpedoes tubes, RPK-8 anti-submarine warfare (ASW) missile system launching 212mm homing underwater gravitational projectiles and MG-94ME hydro-acoustic jamming shells providing protection from torpedoes, RBU-6000 antisubmarine rocket launcher firing RGB-60 depth charge bombs or carrying 90R underwater gravitational projectiles. The Purga-11661 system is offered for export to operate ASW weapons. Those are time-tested and well-known in the market equipment meeting modern requirements.

Some advanced systems also attract increasing attention. Among them is the 91RTE ASW missile of the surface ships fired by the Club-N system and Paket-E/NK small ASW torpedo launcher.

The 91RTE missile will kill all types of submarines at any depth they can go (up to 800m) and range of 5km to 40km. It flies with a ballistic trajectory to the estimated area of operation of the target and parachutes to the water. As soon as the homing system is trigged it will not take the missile long to destroy the target. The 91RE1 missile is compatible with the submarine-based Club-S. The fact that Russian submarines including the Project 636 and Amur-1650 carry it is a key to their superiority over foreign counterparts.

Another advanced system – the Paket-E/NK – provides effective anti-submarine defense at a range of up to 10km and torpedo protection at 100m to 800m. It features a control system, launchers, special sonar, and armaments fitted with 324mm small thermal torpedoes or countermeasure anti-torpedoes. Being one of the cutting-edge systems in the international market, the Paket-E/NK alone can make torpedo protection of the carrier ship 3-3.5 times stronger.

Speaking of submarine-borne underwater weapons, apart from the Club-S that Rosoboronexport offers, there are also 533mm TE-2 all-purpose electric, remotely controlled torpedoes and UGST multipurpose deep-water homing torpedoes.

The TE-2 can destroy submarines at a range of up to 25km and depth of 450m. Its ability to operate in heavy ECCM environment, powerful propulsion unit, built-in test system, long service life, and cheap operation are distinctive characteristics of the weapon. The UGST can also hit ships and stationary targets, as well as submarines at a range of up to 50km and depth up to 500m. Once launched it either can home on the target or be guided to it through its remotely controlled system. Its modular design makes easier a task to reconfigure the missile according to the requirements of the Customer. It is applicable to the whole range of operations

*Far left: Club-type missiles*

*Left: MShM shelf mine*

*Below: Deployed in navies of many countries worldwide*

form reprogramming baseline equipment to replacing engine and storage tanks. There are several warheads for the weapon varying in composition and quantity of explosive.

Another area where Russia also dominates is the mine market. Here Rosoboronexport offers the MDM-1 (packed with 1,100kg of explosive) and MDM-2 (1,030kg) bottom mines to create a mine threat and destroy surface ships and submarines. There is also the MDM-3 (300kg) mine that is destructive to ships with a small displacement and landing craft. All mines are protected from attempts to retrieve them, even using non-contact assets, and detect by sonars and underwater mine hunters.

Extremely effective is also the MShM (packed with up to 380kg of explosive) rocket propelled, moored rising shelf mine designed to destroy surface ships and submarines at a depth of 60m to 600m. As soon as the mine picks noise generated by a target it will launch a rocket. Its high speed and little time required to fire it – up to 25sec – make any evasive maneuver futile.

Rosoboronexport offers underwater weapons that are deployed in Russia's Navy and navies of many other countries. •


## What are the main missions of Mi-17 type helicopters?

- Rapid delivery of light weapons, ammunition and equipment, as well as of military units;
- Assault troops landing operations;
- Fire support for the landed assault troops in the battlefield;
- Medical evacuation of casualties from the battlefield;
- Search and rescue, as well as fire-fighting missions.

**ROSOBORONEXPORT**

27 Stromynka str., 107076,
Moscow, Russian Federation

Phone: +7 (495) 534 61 83
Fax: +7 (495) 534 61 53

www.roe.ru

Rosoboronexport is the sole state company in Russia authorized to export the full range of defense and dual-use products, technologies and services. Rosoboronexport accounts for over 85% of Russia's annual arms sales and maintains military-technical cooperation with over 70 countries worldwide.


# IF WE PROVIDED SERVICE LIKE EVERYONE ELSE, IT WOULDN'T BE PILATUS CLASS.

Pilatus support is distinctly different from what you're used to. Through our global network of dealer service centers – each backed by the technical support, parts and expertise of the factory – your PC-12 is cared for by family: the people who sold it to you, know you and are personally invested in servicing it to our higher standards. Like James Nyitrai, a 25 year aviation veteran at Levaero Aviation, who embodies Pilatus Class service in all he does.

Pilatus PC-12 Centre (Pty) Ltd,
Hangars 41/42, Rand Airport, Germiston.
Tel: 011 383 0800 | Fax: 011 824 0884
Raymond Steyn 082 652 3439 | Tim Webster 083 251 0318 | Gerry Wyss 082 318 5089