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Editorial

It is hard to believe that another year has gone by so incredibly quickly and that 2020 looms on the horizon. In fact, the January 2020 edition of African Pilot is the final magazine that will be produced in 2019, which also marks 19 years of continuous publishing of my magazine. In many ways the past year has been punctuated by roller coaster events in aviation like none before; some good and some very disappointing. Whilst the five professional organisations: The Commercial Aviation Association of Southern Africa (CAASA), the Airlines' Association of Southern Africa (AASA), the Aero Club of South Africa (AeCSA), the Airline Pilots' Association (ALPA) and Mayday SA have done their very best to manage the overall safety of this industry, the same cannot be said for certain elements at the regulator being the South African Civil Aviation Authority (SACAA). When the management of the SACAA starts taking its mission seriously, then we will see a positive turnaround in Civil Aviation in our wonderful country:

To regulate civil aviation safety and security in support of sustainable development of the aviation industry

Perhaps the key to the ultimate success of the regulator are the words 'sustainable development.' We need to understand that all members of the aviation community need to be part of the positive development within the industry. Whilst there are certainly rogue elements within civil aviation, I believe that the vast majority of aviation businesses just want to get on with their work unhindered by constant inspection harassment, especially from people who are not suitably qualified to manage the portfolio entrusted to them. There is so much to gain from quality interaction with the industry and the regulator. I, for one would

like to see a more positive approach handed down from the very top at the Director of Civil Aviation's (DCA) office to all members of staff at the regulator. After all, the President of our country has stated his determination to create jobs and where better than in the aviation industry where South Africa has a significant international presence.

I would like to take this opportunity to thank the hard-working members of the Aero Club of South Africa who have engaged with the SACAA in a most positive light so that the regulator can better understand Sport and Recreation Aviation. These people, amongst others, are Peter and Paul Lastrucci, Rob Jonkers, Karl Jensen, Marie Reddy, Andy Lawrence, Johan Lok, Richard Becker, Sean Cronin, Alan Evan-Hanes and several others. Due to the fact that the Recreational Aviation Administration of South Africa (RAASA) was incorporated back into the SACAA earlier this year, many senior AeCSA members have given huge amounts of their personal time with SACAA officials ensuring the continued 'Freedom of Flight,' which is the AeCSA's motto.

I should like to thank the magazine's loyal advertisers and you readers for your wonderful support this year. I hope and am confident that I and my team can give you an even better African Pilot next year. On behalf of my staff, writers and photographers I should like to wish all our readers who celebrate Christmas a very happy time and to all other readers I trust you will have a most enjoyable holiday.

If you are flying to your holiday destination then fly carefully and remember height is your friend!

Best regards, Athol Franz

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Total value of the competition in this edition is R2 410

December Cover Competition

Aviation Direct has provided an EasyPlan and EasyCockpit bundle. The winner will need to advise whether he / she requires EasyCockpit on Apple iOS or Android format.

Questions

- 1) Please name any two Aviation Direct products
- 2) What canyon is featured on Aviation Direct's advert?
- 3) Where was this year's EAA Sun 'n Fun fly-in held?

October 2019 Cover Competition Winner

Congratulations to the following winner, Carl Thom who has won an introductory flight from Central Flying Academy.

This Month's Cover Competition

Entries to be submitted to the following e-mail only:

info@africanpilot.co.za

One entry per person please. Entries sent to other African Pilot e-mails will automatically be disqualified.

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Dear Athol,

To be honest I doubt whether I am going to continue flying. I didn't renew my licence and I really don't feel like complying to all the 'bull dust' in the industry, especially what the SACAA seems to be thinking about rather regularly any longer. I know this is a rather harsh decision and one I might regret, but also one I will have to take before renewing my licence becomes too much of an issue, or not viable any longer. Listening to and reading about everything that is going around in the industry and having experienced the gross incompetence and the huge effort it takes to get anything done by the SACAA, I'm sometimes almost happy not owning an aircraft any longer. My attitude is probably exactly what the people at the SACAA want, but at least not having anything to do with them anymore and not having to deal with any of them, makes me feel great. Name withheld for obvious reasons

Dear Athol,

This story I believe is newsworthy, simply because of the unlikely and unusual turn of events that occurred on the day of the unveiling of Gordon Dyne's Mirage F1AZ at Brakpan Airfield on 13 October. On the said day, my fiancée Judy Swanepoel invited her brother Charles Freeme and his wife Vivienne flying. I own a Piper Seneca II at Brakpan and we had planned to fly to Charles's farm on a sightseeing tour. We had spoken on many occasions about going flying, but every time we attempted to get together there was always some other more important event or occurrence that precluded us from taking to the skies. However, this day was going to be different, due to the unforeseeable events that unfolded as if by magic.

Event 1 – Very unlikely circumstances

My Seneca (ZS-SNR) was due for MPI and Sunday was the very last day that it could fly before she was grounded for maintenance. On the spur of the moment I suggested to Judy that we invite Charles and Vivienne for a flight. The chances of them accepting were remote because of the very short notice. Judy called him up and lo and behold they had nothing planned and could make the flight.

Event 2 – Charles is at Brakpan Airfield on the same day that Gordon unveils his Mirage F1

On this precise day Gordon had planned to unveil his Mirage F1, to which this event Judy and I had been invited, so it would be a morning of flying and then off to the unveiling. Charles and Vivienne at this point had not been invited to the unveiling.

The four of us arrived early at the airport brimming with excitement for the fun filled morning of flying as we avid aviators tend to do! We pulled the Seneca out and off we went flying over Charles' farm and taking in the sights of the Hartbeespoort Dam. On returning to Brakpan Airfield we parked the Seneca, locked up the hanger and decided to go for a bite to eat at the clubhouse. Whilst walking to the clubhouse Charles wanted to look at the Mirage F1 which was parked halfway into the hangar and two hangars down from mine.

Event 3 - Spotting the name

Whilst admiring Gordon's new found love, Charles noticed that the name of the pilot on the port side of the cockpit read 'Captain Arthur Piercy.' He questioned Judy and me as to why that particular name was on the aircraft and further questioned us as to the fateful event associated with that name. To both questions we indicated that we had no idea. Charles who was stationed at the SAAF's Ondangwa Air Force base in North Namibia in the late 1980s then went on to tell us the story surrounding the events of that sad day, which tragically changed Arthur's life forever. He explained what had happened and, how he was one of the first people at Arthur's side moments after the accident. Judy and I were both fascinated by his story and asked Charles if he would like to meet Gordon who could maybe shed some light on the reason that Arthur's name was on the cockpit of his newly refurbished Mirage F1.

After lunch we all proceeded to Gordon's man cave to meet up with Gordon. On arrival I introduced Charles to Gordon where he proceeded to question Gordon about Arthur's name on his Mirage F1, to which Gordon responded: "Arthur is my hero and that is why his name is there." (Captain Arthur Piercy

Dear Anonymous,

Thank you for your mail. Sad, but understandable. I am afraid that your sentiments are being expressed throughout the aviation industry in South Africa. Some people refer to the regulator as the 'Commission Against Aviation' and having being involved with the many issues that are shared with me as I walk the ramps of various airports, I agree that the SACAA is doing everything it can to disrupt civil aviation in our country.

Perhaps when I retire one day and also 'hang up my gloves' I will write a book on how the SACAA destroyed South African civil aviation, because I have so many examples of the sheer incompetence of the over staffed regulator that cannot function properly.

Sincerely, Athol Franz



Arthur Piercy and Charles Freeme

was a SAAF Mirage F1 pilot and on 27 September 1987, his aircraft was badly damaged by a missile fired from a Cuban MiG 23 over Angola. Arthur, by some miracle, managed to fly his Mirage back to his Ondangwa base, but upon landing with neither brakes nor hydraulics, the aircraft could not be stopped and the resulting crash sadly put Arthur into a wheelchair for the remainder of his life).

Event 4 – The reunion

Charles continued to tell Gordon about his story to which Gordon responded: "Terrific! Well you can meet him; I have invited him to my party." This for Charles was almost too good to be true. What were the chances of such an encounter after 32 years? Since that unfortunate day, Charles has on the odd occasion spoken to Arthur on Facebook, but had never met with him face to face since the event. Arthur duly arrived and after so many years both were able to reminisce about a day that changed the shape of both men's lives. Incredible emotional remembrances of the event gave meaning to life.

The chances of circumstances all falling into place as they did on this day are remote and in my view one in a million. To witness the two men reuniting after such a long time was special. Hopefully other people will also find this story special and if not at least very interesting.

Regards, Shawn Schubotz

Dear Shawn,

Thank you for your wonderful story about Charles and Arthur meeting up at the unveiling of Gordon Dyne's Mirage F1 full scale decoy on Sunday 13 October. Unfortunately, I was attending the Airlines' Association of Southern Africa annual general meeting in Reunion and I only arrived back in South Africa late that Sunday night so I missed a wonderful occasion. However, Charlie and Fiona Hugo attended this splendid party and Charlie's report with pictures is contained in this edition of African Pilot.

Regards, Athol

Camel Pilot Supreme – Captain D.V. Armstrong

Author: Annette Carson. Publisher: Pen and Sword

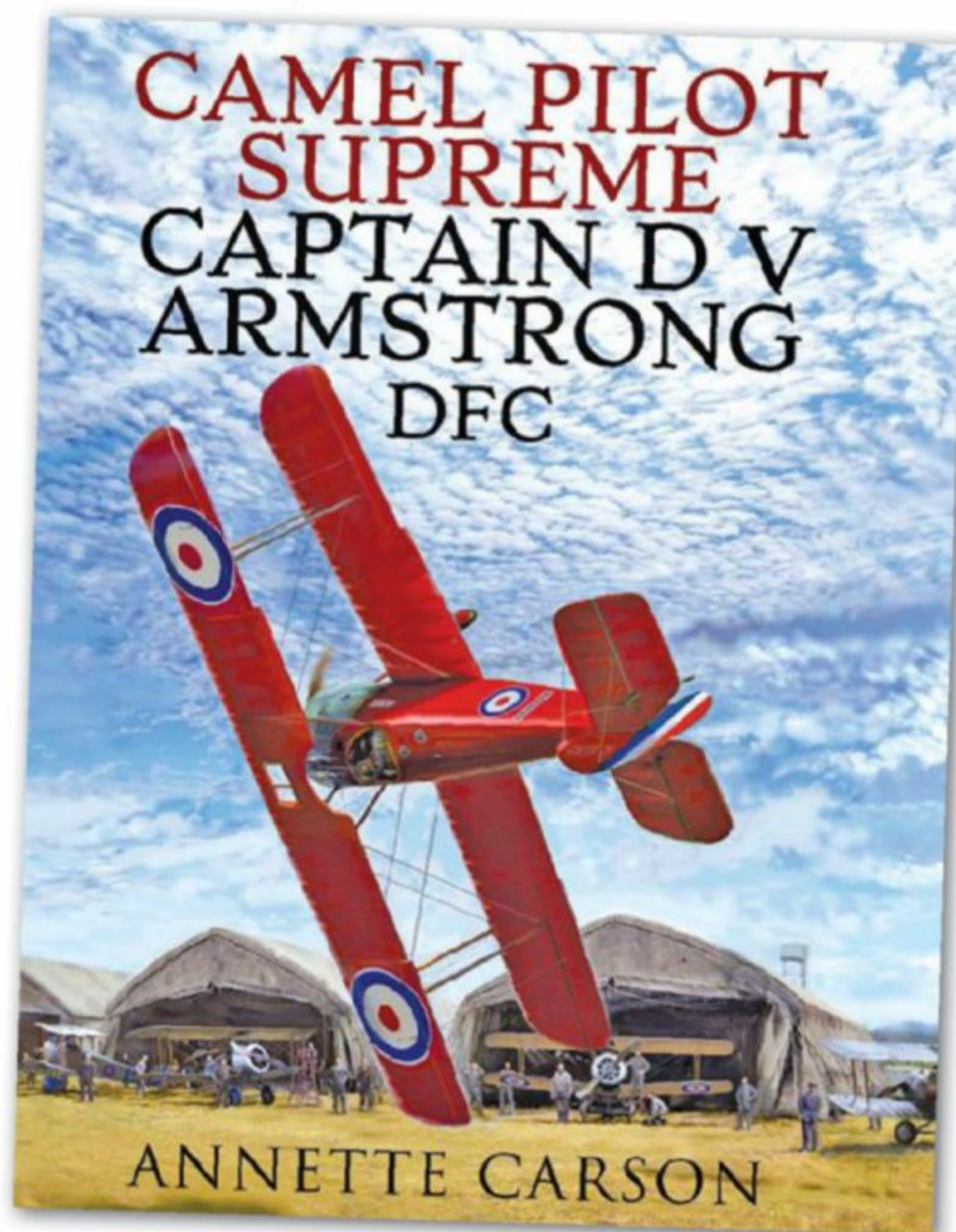
Reviewed by Quintin Hawthorne

Whilst attending the World Aerobatic Championships in France earlier this year, I came across a newly released book that has, as it turns out, an important South African aviation connection. Written by acclaimed aviation author Annette Carson, *Camel Pilot Supreme* tells the story of a South African born pilot who achieved fame during the Great War 1914-1918. Captain DV Armstrong, who hailed from Durban, left South Africa in 1915 to join the Royal Flying Corps (RFC) in England and went on to become a legend for his feats in his little Sopwith Camel fighter plane. His superb piloting skills and mastery of the aircraft saw him earn key successes against the enemy in the aerial war which put him in great demand as a flying instructor. He was considered to be the 'finest pilot the Royal Flying Corps ever produced.' My interest was really piqued when I read of his dazzling aerobatic performances; his low-level loops from take-off and flick rolls after bouncing the little Camel on the runway before landing, were legendary and the young pilot quickly earned the reputation of being the 'best aerobatic pilot of his day, bar none.'

Along with a pilot's-eye-view of flying WW1 aircraft, Carson gives a wealth of detail about Armstrong's South African roots and his time in the RFC, with many asides of his friendships, his life off the airfield and eyewitness accounts of his extraordinary skill. It is particularly well illustrated featuring over 170 images including original photographs sourced from Armstrong's own collection, enlivened with colour paintings by well-known artist Lynn Williams.

Whilst some of his contemporaries such as Pierre Van Ryneveld and Quintin Brand were lauded for their later achievements, very little is known of this South African flying hero until Annette Carson published this well researched biography that now allows Captain Armstrong to take his rightful place amongst the heroes of pioneering flight. A 'must-read' for any aviation enthusiast, it looks set to appear

on many a Christmas gift list. Published by Pen and Sword, it is available locally in hardcover from www.Loot.co.za. An eBook version is available at www.pen-and-sword.co.uk.





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CEO, AASA*

*Mr Paul Steele
Senior Vice President
member & External
Relations, IATA*

AASA 49TH ANNUAL GENERAL ASSEMBLY

10 – 13 OCTOBER 2019 - REUNION ISLAND

BY ATHOL FRANZ

Staged on the beautiful tropical island of Reunion, this year's Airlines' Association of Southern Africa's (AASA), theme was: 'What is stopping us?

What is not?' In his opening address, Chris Zweigenthal CEO of AASA said: "Every year I consider the world in which we live and operate and I think: "Next year it will be different, because it can't get any crazier!" Well! I am wrong again! It can! Look at what is happening in the US, the UK, EU and BREXIT, trade wars, China, Russia, Ukraine, North Korea, Saudi Arabia, Iran, Syria, Yemen and so many more, let alone regional and local developments."

Zweigenthal continued:

“
So, where do we find our
industry in this context?
”

The International Air Transport Association (IATA) expects the global scheduled airline industry to achieve a US\$ 28 billion profit this year. Although down from a US\$ 35 billion profit in 2018, it will be a positive result if the expectation is correct.

In contrast in Africa, where airlines are collectively expected to lose another US\$ 300 million in 2019. This is a re-run of 2018 and the ninth straight year of losses for the continent. The picture is similar for our sub-region. For almost a decade we have failed to turn 'the red ink to black.'

However, Zweigenthal's speech and those by many of the fine speakers at the all-day Friday conference were fairly upbeat about how technology would be the key driver to future airline operations.

Excerpts from Chris Zweigenthal's presentation

The airline industry is critical for enabling socio-economic growth and development. It facilitates investment, trade and tourism. Viable and sustainable airlines create and support jobs, foster skills development, drive innovation, encourage entrepreneurial initiatives and enhance economic competitiveness.

So – 'What is Stopping Us?'

I am convinced that most of Africa's leaders do not fully appreciate aviation's strategic importance and the benefits it delivers. AASA, in conjunction with IATA, the Air Transport Action Group and ICAO persistently draws government authorities, regulators and policy-makers' attention to these benefits. Our aim is to encourage collaboration and achieve mutually beneficial solutions. Inconsistent policies within and between states must be addressed. A positive development is the African Union's attempt to establish the Africa Continental Free Trade Area. When fully implemented, it will be the world's largest single trading bloc. Aviation, trade and tourism are amongst its key pillars. Trade and Tourism will flourish if people and goods can move freely throughout the continent in a visa-free and streamlined customs environment. Visa waivers or visas on arrival are a step in the right direction, but meaningful progress on both fronts is frustratingly slow.

In South Africa, the Government has acknowledged the negative impact on tourism of current visa regulations and unabridged birth certificate requirements for minors. On Wednesday 9 October we were



*Ms Zukisa Ramasia, Acting CEO,
SAA Chairperson, AASA*



*Mr Marie Joseph Male,
Chairman & CEO, Air Austral*

advised that President Ramaphosa has instructed the Department of Home Affairs to rescind this requirement for foreign based minors. We await confirmation of its revocation in hopeful anticipation. The CEO and team at Tourism Business Council of South Africa must take a lot of the credit for this latest positive development. Aviation's most important contribution on the continent is to connect markets. In this respect, reforming Africa's air transport regulatory framework remains critical.

The African Union's Single Africa Air Transport Market (SAATM) initiative, intended to operationalise the Yamoussoukro Decision of 1999 is intended to help governments leverage sustainable economic growth by opening up and connecting trade and tourism markets with expanded air services. For airlines it should reduce unit costs whilst increasing revenue. For travellers and shippers, it means greater choice and reducing the cost of travel and business. However, there are differing views on SAATM. Most are born out of concerns of the impact of SAATM on their businesses. In addition, some airlines and regulators fear what they see as uneven playing fields, especially with respect to the process of granting fifth freedom rights sometimes without reciprocity allowing airlines of one country to fly passengers and goods between two other countries. Through the African Civil Aviation Commission (the Executing Agency), the Africa Union (AU) must convene a meeting of concerned states and airlines (including some that have committed to SAATM), to identify and thrash out the problems. Africa's credibility is on the line.

For airlines to be profitable, revenue must exceed costs. In Africa the revenue generated reflects the competitive state of play. Yields are generally higher on regional flights and lower for international flights. This is a result of the intense competition provided by airlines from beyond Africa. African airlines' unit costs remain high. Many are dollar based, including aircraft leasing and financing, distribution, maintenance, some infrastructure service provider costs and jet fuel, which sells at an average 35% premium compared with global average prices. Whilst African airlines cannot influence currency exchange rates, they must narrow the delta between costs and revenues by increasing aircraft utilisation, raising productivity and reducing other unit costs. This would enable them to offer competitive services enabling them to sell fares at levels that cover their costs, a move towards sustainability.



*Mr James Christie,
Program Director*



*Mr Fabrice Grondin,
Aeroport de la Reunion Roland Garros*



Group picture with most of the delegates

Our industry has been dominated by men, but our region is making some progress in righting the gender imbalance. In South Africa, about 52% of all airline employees are women. While most are in the lower management and staff, three of the eight airline CEO's (38%) are women. Across the SADC region it is 15%. This compares favourably with the rest of the world, where, according to IATA, just 3% of scheduled commercial airlines' CEOs are women. However, in the specialist fields, including pilots, aviation engineers and technicians the statistics paint a gloomy picture. In South Africa, women account for 10% of airline pilots and 10.5% of technicians and engineers. As a high-profile sector, there is much work still to be done. Skills development and mentorship programmes must be implemented so we can transfer the necessary knowledge, expertise and skills, knowing, when it is time to pass the baton, that we can place it in capable hands.

Climate Change should not hold us back. The Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) was reaffirmed at the ICAO Assembly last week. Ten African countries, including three SADC nations, have volunteered for the 'pilot and first phase' of CORSIA. All states operating international flights above a certain threshold, must comply with an emission reporting programme to their States. This commenced on 1 January 2019.

This generates an awareness and need for carbon emission reduction by airlines. Historically, Africa's safety record was dire, but remarkable progress has been made over the past decade and it should no longer hold us back. 2017 and 2018 were unblemished by any fatalities or hull losses involving scheduled airline operations in Africa.

The tragic loss of the Ethiopian Airlines Boeing 737 MAX this past March not only brought this run to an end, but has raised serious questions about aircraft design, technology and certification, pilot training and



*Mr Vivendra Lochan,
COO, AASA*

recruiting standards and human factors on the flight deck across the board. It also prompted a worldwide crisis of confidence in the airworthiness certification model that has been in place and served the industry for decades.

Our entire industry needs certainty from the safety regulators in each state, on how they will recognise airworthiness certification programmes run by authorities in other countries. This is of particular importance in countries, including those in Africa and our region, which until now have relied on their counterparts in the US, Europe, Canada

and Brazil (representing the countries where the major airframe and engine manufacturers are based) to vouch for the safety of new aircraft and their engines. We cannot have a patchwork situation where commercial airliners and engines are deemed safe and fit for purpose in one jurisdiction, but not in others. Trust must be restored.

Changes to the safety, regulatory and airspace management systems are also required to accommodate the increasing fleet of unmanned airborne systems as they take on more commercial air transport roles. This is not just about safely sharing airspace, but how we share the commercial space. We are no longer talking about gimmicky Christmas toys, but sophisticated aircraft capable of carrying heavy cargo loads over relatively long distances. They are about to revolutionise the logistics' industry in tandem with a boom in e-Commerce and online shopping. Airbus, Boeing, Embraer, Amazon and numerous start-ups are also developing and testing passenger and cargo carrying UAS concepts. Rwanda and Ghana are global pioneers, hosting sophisticated UAS systems that deliver medicines from the main centres to remote communities. Visionary airspace design and management ensures they operate safely. Data-driven technologies represent additional opportunities for

African airlines to unlock additional value especially if they take the hassle out of travel for passengers and make doing business more efficient. The flip side is an imperative for vigilance and continual investment in robust protection and data security systems. Securely preserving the integrity and privacy of data is crucial, especially in the air transport and allied sectors where transactions are made with people and businesses in numerous jurisdictions and covered by various laws.

I have looked back past state of the industry addresses, which have often concluded that: “we need to do something about our situation, but progress is slow”. We have all seen this movie before. It is time we stopped hitting ‘repeat’ and press ‘play’ to start a new episode – the one which sees new partnerships and alliances formed, opportunities created (and taken), with a vibrant and heroic Africa emerging.

I wish to thank the AASA team for inviting me to its General Assembly and for making the occasion in Reunion a huge success. The next AASA conference will be hosted by Airlink in South Africa in 2020. ✈



*Mr Marie Joseph Male,
Chairman & CEO,
Air Austral*

*Mr Christopher Buckley
Exec Vice President,
Commercial Airbus*

*Ms Victoria Moores,
Air Transport Editor, African Aerospace*



*Mr Paul Steele
Senior Vice President member &
External Relations, IATA*

*Left to right:
Ms Zukisa Ramasia; Mr Male; Ms Wrenelle Stander;
Mr Rui Carreira CEO, TAAG Angola Airlines;
Mr Elmar Conradie, CEO FlySafair*



*Mr Vivendra Lochan,
COO, AASA*

*Ms Zukisa Ramasia,
Acting CEO, SAA
Chairperson, AASA*

*Ms Wrenelle Stander
Joint CEO, Comair Limited
Deputy Chairperson, AAS*

*Mr Chris Zwiegenthal
CEO, AASA*



The last hurrah of the Boeing 747: The Intercontinental Queen

On 12 October 2011, Cargolux operated the first commercial flight of the newest version of the Queen of the Skies, the 747-8. Whilst the flight only carried freight from Seattle-Tacoma International Airport (SEA) to Luxembourg, both Boeing and Cargolux could not be any less excited. The then-president and Chief Executive Officer of Boeing Commercial Airplanes, Jim Albaugh said that the 747-8 Freighter was “truly the Queen of the Skies for the 21st Century.” Frank Reimen, who was then the CEO of Cargolux, added that the company was looking “forward to the efficiency and environmental benefits that come with this great airplane.” A year later on 1 June 2012, Lufthansa introduced the Boeing 747-8I, a passenger version of the quad-jet, dubbed the Intercontinental.

Yet the Queen's newest iteration never really took off.

Ever since it was announced in 2005, orders were rather scarce. As of 30 September 2019, airlines ordered a total of 154 even falling short to the Airbus A380, its direct competitor. However, the business case for it was and still is, an interesting one. Boeing had a big advantage over the Super Jumbo as the 747-8 could be operated as a freighter and Airbus never introduced the A380F. Furthermore, its operating economics were far superior, at least according to Boeing; the aircraft “will offer 22 percent lower trip costs” compared with the A380, Boeing's press release stated.

The United States' manufacturer also predicted that the industry will have a need of ‘900 airplanes – passengers and freighters in the 400-plus-seat segment’ up until 2025. However, that prediction was way off. Combined total orders for the 747-8 and the A380 are less than half of the initial prediction of 444. This being 154 for the 747 and 290 for the Airbus A380.

So, why the Intercontinental is just a Local?

Much emphasis was placed onto the freighter version, the 747-8F. Two launch customers for the 747-8 family were cargo companies – the aforementioned Cargolux and All Nippon Airways' cargo subsidiary, Nippon Cargo Airlines. Boeing launched the aircraft on 14 November 2005, with firm orders for 18 aircraft. 10 from Cargolux and eight from Nippon Cargo with 16 options, both from the same two cargo airlines. The passenger version of the Boeing 747-8 attracted its first customer on 6 December 2006,



when Lufthansa inked a contract for 20 firm and 20 options for the Intercontinental. The emphasis on cargo operations for the 747-8 is even more clear when you focus on the split of orders and deliveries between the Freighter and the Intercontinental:

Out of orders for 154 aircraft, 47 were for the passenger version. Since the last delivery on 10 December 2017, Boeing has not received any new orders for the 747-8I. In contrast, the cargo Queen has orders for 107 747-8Fs, with a backlog of 19 aircraft, as of 30 September 2019. However, its last order was 10 months ago, when Volga-Dnepr UK ordered three 747s on 29 December 2018.

With a backlog of 19 aircraft, the production of the Queen is set to cease in 2023, as Boeing currently produces 0.5 747-8s per month since September 2016. In 2016, the manufacturer already lingered around with the idea of ceasing production completely in 2019, as it had to incur a reach-forward loss of \$1.1 billion due to weakening demand for the 747.

On 21 July, the current Chairman, President and CEO of Boeing, Dennis Muilenburg noted that the company was monitoring the ‘air cargo market and aggressively driving productivity and cost reduction as it works to win additional orders to support ongoing production.’ It seems as if the strategy has somewhat paid off – UPS salvaged the programme in 2016 and once more in 2018 with relatively big orders. On both occasions, United Parcel Service (UPS) ordered 14 Boeing 747-8 freighters, extending the backlog with 28 total additional aircraft. ✈



Department of Transport and SACAA provide insight into the grounding of 46 airliners

By Athol Franz

*Mr Ernest Khosa chairman of the board of the SACAA,
Mr Fikile Mbalula Minister of Transport South Africa,
Ms Poppy Khoza DCA SACAA
and Ms Fundi Sithebe
Airports Company
South Africa*

On Tuesday 22 October 2019, the South African Civil Aviation Authority (SACAA) called for the grounding of 46 airliners serviced by South African Airways Technical (SAAT). This was significantly the largest single grounding of airliners in the history of South Africa.

In my opinion, what was a completely unnecessary move on 22 October the SACAA grounded two of South Africa Airways' (SAA) planes, prompting other airlines serviced by South African Airways Technical (SAAT) to self-ground a total of 46 airliners. They were 14 from Comair, nine from Mango and the balance of 23 were SAA airliners. Within less than two days all the airliners had been released back to service, but the reputational damage had been done, whilst the scare tactics of the Regulator became a serious problem with the South African travelling public.

So, what was the problem? According to information at hand the Regulator found fault with the SAAT technical staff who were found not to have the correct licences to sign off radio telepathy inspections. The matter concerned the cockpit voice recorders and flight data recorders of the affected airliners. In addition, aircraft communication radios were affected by the grounding.

Now here comes the surprise! All the technicians who signed out the radio work are qualified to do so, but the SACAA had changed the procedure whereby at South African Airways Technical, their licences could be processed and then sent to the regulator. It appears that the Regulator did not process the licences in the required timeframe. How was it possible to release all the affected airliners back to service so quickly, within one and a half days, if this had been a significant finding? All this grounding and forced self-grounding achieved, was to inconvenience hundreds of travellers over the two days. In addition, the three affected airline operators and Airports Company South Africa (ACSA) were severely affected. With some foresight and nous, the SACAA could have issued a notice of intention to ground, providing SAAT five or more days to sort out the paperwork with it.

For several years now the Commercial Aviation Association of South Africa (CAASA) has been involved in trying to solve its members'

problems with the Regulator, but many times the process takes far too long to resolve and often the client is then victimised by the staff of the Regulator. I have now been reliably informed that the many matters the CAASA has taken up with the regulator are now being attended to by a dedicated person at the Regulator who has excellent aviation knowledge. I also understand that the only dossier that is still seriously outstanding is that of the Commercial Unmanned Aviation Association of South Africa (CUAASA). As I walk the ramps of many of South Africa's airports, I constantly hear about the bullying tactics of SACAA inspectors, the lack of knowledge of inspectors and the general tardiness of these officials. When is this going to change?

At the conference called at OR Tambo International Airport, I challenged Ms Poppy Khoza, the Director of Civil Aviation (DCA) about this situation at the time when media personnel were afforded the opportunity to ask questions. I provided just one example to the media in attendance about the lack of knowledge of a particular inspector. In her reply Ms Khoza defended her organisation by commenting that what I was saying was 'hearsay' and that there were 'no CAASA dossiers on the SACAA's desks'. One can make up one's own mind about her statement, because my further research has clearly indicated at there are still many matters involving CAASA members that have been presented to the Regulator, which are being attended to albeit at a very slow pace.

I have also been reliably informed that the person who heads up the anti-corruption section at the SACAA has been 'suspended,' because allegedly he had opened a case against his immediate superior, who apparently has been running his personal funeral business whilst employed at the Regulator! There are many more allegations that are coming out of 'whistleblowers' at the SACAA about irregular matters where individuals have allegedly been told to 'keep their mouths shut.' Can you really credit it?

The other and most important matter that was raised by a member of the media that was not addressed fully at the conference, was the matter of the SACAA's website and encrypted documents being seriously hacked a few months ago. The real problem with this particular situation is that the Regulator's records have been compromised and personal licencing information is part of the data that is either missing or has been stolen. All of what appears to be happening, or not happening, at the Regulator is very bad for South African Civil Aviation and although there will always be some half-truths, I sincerely do not believe that ALL of Commercial General Aviation can be wrong! ✈



Boeing NMA or re-engined Boeing 767?

Hints about Boeing developing a new aircraft, dubbed the Boeing New Midsize Airplane (NMA) or the Middle of the Market (MOM) aircraft, have been around for quite a while. In 2015, the now-retired Boeing Commercial Airplanes' sales chief, John Wojick, commented that the manufacturer is looking at the possibility of developing a new aircraft for the middle market.

However, reports have emerged that Boeing is also looking into the possibility of steering away from the NMA and improve the 767 instead. It has been reported that the foundation of the re-engined aircraft would be the 767-400ER, with General Electric's (GE) GEnx engines powering the newest iteration of the wide-body, which made its first commercial flight with United Airlines in 1982. The main focus of the 767-X study is a freighter, but the Chicago-based offices are also lingering around with the idea to apply the 767-X case to carry passengers as well. During AIR Convention Europe, Drew Magil, the Boeing Commercial Airplanes' Managing director for Marketing in Europe, highlighted that Boeing's strategy 'has always been to cover the market with a complete line of planes,' adding that the company has 'a complete line-up.' Yet Magil also touched upon the fact that there is 'a strong market between the 737 and the 787', something the company calls 'the middle market.'

Airbus is already amassing orders for three aircraft, which serve the market's requirements: the A330-800, A321XLR and the A321LR. The first mentioned is a wide body, typically seating between 220 and 260 passengers. The XLR and the LR typically seat between 180 and 220 passengers, but according to Airbus, the A321XLR can seat up to 244 passengers in a single-class layout. Up until now, it was an open secret that Boeing plans to build a new aircraft to serve the middle market. However, with sources indicating that Boeing is also looking into the 767 re-engined, nobody knows what is in Boeing's box labelled 'Middle of the Market aircraft.'

CHANGING FLIGHT PATHS

Why are both manufacturers so keen to serve the middle of the market, with an aircraft, which Ron Baur, who served as United Airlines' Vice President in Fleet Management between 2010 and 2017, described as

a '757 on steroids?' Simply put, the aviation industry is slowly shifting away from the hub-and-spoke model. As air travel becomes more accessible due to cheapening costs and economic growth around the globe, the number of city pairs connected has also increased dramatically. According to IATA, in 2018 around 22,000 city pairs were connected with scheduled flights amounting to an increase of 1,300 direct connections compared with 2017, or an increase of more than 10,000 compared with 2000. Mainline carriers are venturing into direct, point-to-point flights on routes which were previously too thin to operate, but still do not have enough demand for wide-body aircraft or are unreachable by the most popular narrow-bodies, the 737 or the A320.

For example, American Airlines announced new routes on 8 August 2019 – one of the new routes, from Philadelphia International Airport (PHL) to Casablanca Mohammed V International Airport (CMN), Morocco will be flown by a Boeing 757, nicknamed the Flying Pencil. American Airlines will serve the fairly thin route (operated only during the summer months three times per week) with its Boeing 757-200, which the airline configures the three-class cabin in two ways. One variant seats 176 passengers, the second can fit up to a maximum of 188 passengers. Aircraft such as the 757 still finds its place under the sun; operating routes that do have enough demand to sustain a connection, yet not enough to make a wide-body aircraft economically viable. As of December 2018, more than half of the total delivered 757s are still flown; 669 out of 1049, according to data. However, the Boeing 757 is quite outdated and Boeing closed the production line in 2005.

Therefore, not only is there is a demand for new, narrow-body aircraft with exceptional range capabilities, but replacing the aging Flying

Pencils is also a concern for many operators. Airbus has provided exactly that with two separate aircraft – the A321LR and the A321XLR. The former is already in service, as Arkia took delivery of the first A321LR on 14 November 2018. The Airbus A321XLR is exactly what Baur asked for in 2016; ‘a 757 on steroids’ as the XLR has more range, can carry the same number of passengers whilst burning less fuel. During the Paris Air Show 2019, the newest A321 became a blockbuster when the European manufacturer amassed orders for more than 200 of the type.

Yet the wide-body Middle of the Market aircraft Airbus provided to customers has stayed in the shadows of the A321XLR’s success. As of 30 September 2019, Airbus only has orders for ten of the A330-800. This is the first indication as to why a re-engined 767 would not work, at least for passenger service, as both the A330neo and the 767-400ER carry a similar amount of passengers – A330-800 can seat a maximum of 406 passengers, whilst the 400ER is allowed to fly 409 in an all-economy configuration.

Even if the newest iteration of the type would be based on an old platform, the manufacturer would still have to make changes to the aircraft’s design. According to the report, Boeing is looking into fitting the GENx engines on the 767-400ER platform. Currently, the 400ER uses General Electric CF6-80C2. GE claims that the GENx offers ‘up to 15% improved fuel efficiency and 15% less CO₂’ compared with the CF6, but the new engine would be much bigger in diameter (111 inches versus 106 inches), length (184.7 inches versus 168 inches) and weight (13,552 lbs versus 9860lbs), potentially offsetting the balance of the aircraft – just like with the 737 MAX.

Both the 737 and the rumoured 767-X have issues with ground clearance due to the bigger engines, which means that Boeing would also have to update the landing gear design on the new 767. The company has not produced a passenger-configured plane of the type. Whilst the company still produces freighters and the military tanker KC-46 Pegasus, those do not include seats, amidst other must-haves for passenger aircraft. Restarting production would not be a walk in the park, as supplies for the interior and production lines would need re-arrangements, even if the passenger version of the re-engine would be built under the same roof as the current 767 freighters.

In addition, the company, which is in the middle of the 737 MAX crisis, would have to think twice before placing a new engine on an old aircraft. Thus, the combination of low demand, as showcased by the 767-X’s direct competitor, potential complex design changes, production difficulties and a rocky relationship with the public potentially rules out a re-engined passenger version of the 767, whilst

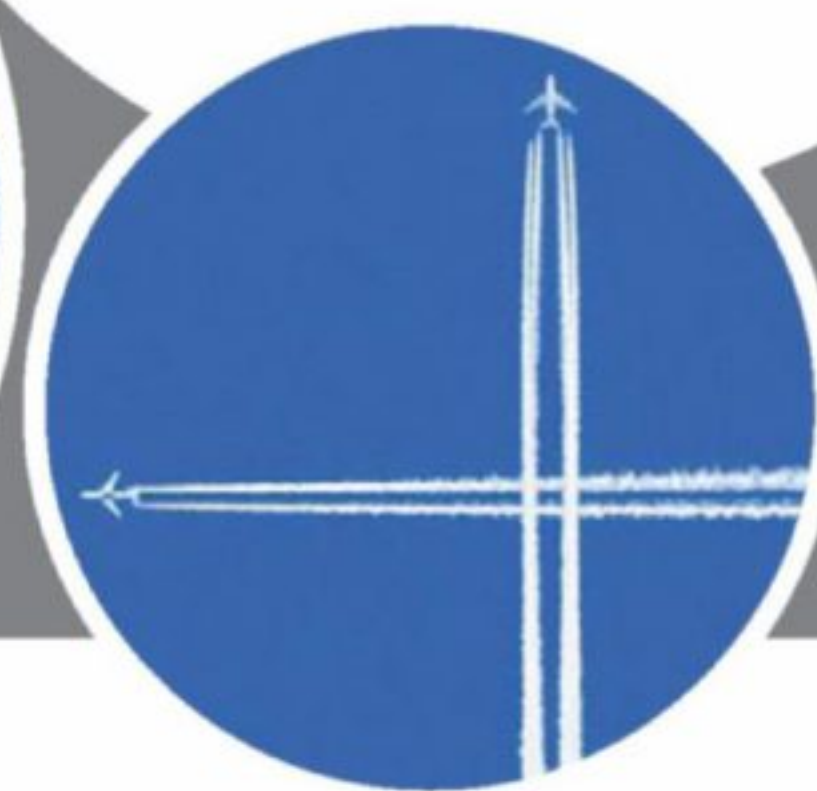
the 737 MAX situation has created a never-ending headache for Boeing executives. Furthermore, the 777X timeline is getting pushed back because of issues with its GE9X engine, as General Electric was forced to redesign a crucial component in the power plant.

It is clear that the company wants to compete for the Middle Market, replacing the outgoing Pencils and introducing new aircraft into airline fleets. However, now the question is whether the company has enough cash to splash out. Q2 2019 was the biggest loss in Boeing’s history; the manufacturer’s financial statement showed a nett loss of \$2.9 billion. Most of the loss was attributed to the fact that the company took a charge of \$5.6 billion related to the 737MAX groundings. Boeing is set to provide an update on its financial situation on 23 October 2019, when it will announce its Q3 financial results.

Initially, the manufacturer aimed to launch the NMA in 2025; two years after Airbus plans to deliver the A321XLR to airlines for commercial service. However, with the 737 MAX crisis, which has emptied the pockets of Boeing, the goal of NMA operating for an airline in 2025 might get pushed back a few years, losing crucial time to its direct competition. One thing is clear; Boeing needs to respond to Airbus’ attempts to capture a market, which Boeing believes has the potential for more than 4,000 aircraft in the next 25 years. ✈



Is Europe doomed with overcrowded skies?



European airspace is very, if not the most congested airspace in the world. Speaking at AIR Convention, Wizz Air CEO, József Váradi said that the “ATC is almost completely dysfunctional” on the continent. Even so, by 2040, Europe will have a capacity gap of 1.5 million, accounting for more than 160 million passengers not being able to get on a flight, according to EUROCONTROL growth predictions. However, today, the issue is also relevant as airports are becoming congested with limited slot space and the constant lack of manpower both in the cockpits and in the air traffic control towers. Is European air space too saturated to be able to grow?

What are the options to sustain the growth of traffic without filling up the skies with too many aircraft?

Unclogging the airways

Whilst organisations such as EUROCONTROL and governments could unite forces and establish projects like SESAR, which aims to improve Air Traffic Management by conducting joint research, there are other options.

One option is to reduce air traffic by using larger aircraft. In part, this is already happening, as manufacturers keep increasing the size of narrow-body aircraft, tailored for short-haul travel. Airbus plans to deliver its biggest A320 family member, the A321XLR in 2023, which can seat up to 220 passengers in a typical two-class configuration. In contrast, the original A320 had a typical seating of 150 passengers when it made its commercial debut in 1988 with Air France. Boeing has also stretched the 737, the newest and the largest version of the narrow-body, the 737 MAX-10, can seat up to 230 passengers.

Secondly, looking at alternative airports to expand infrastructure instead of looking to acquire slots at the main hub points is a great way to reduce congestion. One example is London and its airports: Heathrow (LHR), Gatwick (LGW), Stansted (STN) and Luton (LTN) which are approaching their capacity limits. Airlines have now turned their attention to London-Southend Airport (SEN). Whilst for now, mostly low-cost carriers operate from the airport new competitors are entering the business, with Wizz Air being the ‘fresh face on the block.’ The airline has proclaimed that it will ‘soar from Southend Airport’ and introduced two new routes to Bucharest and Vilnius starting in November 2019. Whilst infrastructure and using

airports that are 41 miles (61 kilometres) from the city centre are an issue, it does in the long run provide airlines with the opportunity to grow capacity without spending ridiculous amounts on acquiring slots at airports with limited space.

However, the congestion above Europe’s sky might be solved by someone other than aviation experts. Whilst airlines are bickering between themselves for passengers, high-speed rail is becoming a threat to carriers. The aforementioned job cuts by Air France were also the result of the airline losing over 90% of market share in the domestic market to high-speed rail (TGV). According to Eurostat over the past few years, passengers using rail services have increased in Europe: travellers accumulated around 430 billion passenger-kilometres in 2013. In 2017 the number has increased to 465 billion passenger kilometres.

The bottom line is that the sky above Europe is becoming increasingly overcrowded. Last summer’s events have showcased that the continent is not ready to handle service disruptions, as freak-events have pushed the airline system in Europe to its limits, with never-ending delays and flight cancellations resulting in mounting compensation claims due to Regulation No 261/2004 and subsequent bankruptcies due to these bills. Offering lower prices just so passengers will board your aircraft, rather than that of your competitor and diminishing rather than increasing capacity at the Continent’s busiest airports begs the question whether the bubble of overcapacity will burst causing additional and more painful bankruptcies across Europe and whether the sky can handle the ever-increasing traffic. 🛫



IndiGo signs for 300 A320neo Family aircraft

On 29 October, India's IndiGo placed a firm order for 300 A320neo Family aircraft. This marks one of Airbus' largest orders ever received from a single airline operator. This latest IndiGo order comprises a mix of A320neo, A321neo and A321XLR aircraft. This will take IndiGo's total number of A320neo Family aircraft on order with Airbus to 730.

"This order is an important milestone, as it reiterates our mission of strengthening air connectivity in India, which will in turn boost economic growth and mobility. India is expected to continue with its strong aviation growth and we are well on our way to building the world's best air transportation system, to serve more customers and deliver on our promise of providing low fares and a courteous, hassle free experience for them," said Ronjoy Dutta, Chief Executive Officer of IndiGo.

"We are delighted that IndiGo, one of our early launch customers for the A320neo, continues to build its future with Airbus, making IndiGo the world's biggest customer for the A320neo Family," said Guillaume Faury, Airbus Chief Executive Officer. "We are grateful for this strong vote of confidence as this order confirms the A320neo Family as the aircraft of choice in the most dynamic aviation growth market." He added: "We are pleased to see Airbus allowing IndiGo to take full advantage of the predicted growth in Indian air travel."

IndiGo is amongst the fastest growing carriers in the world. Since its first A320neo aircraft was delivered in March 2016, its fleet of A320neo Family aircraft has grown into the world's largest with 97 A320neo aircraft operating alongside 128 A320ccos. The A321XLR is the next evolutionary step from the A321LR, which responds to market needs for even more range and payload, creating more value for the airlines. The aircraft will deliver an unprecedented Xtra Long Range of up to 4,700nm, with 30 percent lower fuel burn per seat compared with previous generation competitors' jets. At the end of September 2019, the number of the A320neo Family aircraft on order with Airbus totalled 6,650 from almost 110 customers worldwide. ✈



Piloting aviation-grade technology solutions

Over the past six months Nacelle, a technology solutions and services' provider for the travel and aviation sector, has been tackling the Comair Electronic Flight Bag (EFB) backend architecture, user-interface and front-end design. The original EFB was built by pilots at Comair almost a decade ago and although considered exceptionally comprehensive in its functionality, it has not benefited from the latest digital developments and design thinking.

To move Comair's EFB forward, Nacelle embarked on a process of immersing itself in the lives of pilots by employing a number of methodologies developed to enable it to appreciate the complexity of the aviation environment, empathise with the pressures that pilots face, and gain a deep understanding of the pilot's experience with the EFB system itself. Noting the specificity of the aviation space, Comair Captain, Cornelius Dannhauser stressed that: "the aviation end-user is a very specific client. The environment in which a pilot works is a very unique one with unique challenges. As an industry we learned long ago that involving the end-user in the finished product is critical for a safe operation."

Everything designed needs to work in the worst-case scenario and Nacelle believes that it is the pilots themselves that should lead design and development teams to an understanding of how the EFB system and functionality is practically applied in their working environment. Furthermore, there are specific information streams that a pilot requires, in a specific format and a specific logic that only a pilot understands. As such, it was paramount for Nacelle to keep the pilots close and trust their advice when it came to the technical aspects. Warren Edwards, a First Officer at Comair noted that: "as procedural as our environment is, we often have to adapt and it is this changing environment that makes it difficult for a non-pilot to understand our needs fully. However, I think having input from design specialists helps deliver a modern, user-friendly end product."

Comair pilots of varying levels of experience and technical proficiency were engaged, enabling the team to gain a greater variety of input. In support of this approach, the project sponsor, Johann Bruwer, Flight Technical Manager at Comair stated that: "including the younger generation of pilots in the different processes results in non-traditional thinking about the software display." Initial engagements with pilots involved observation flights on jump seats, whereby the designers noted task flows, inconsistencies and commonalities of use, which began to isolate opportunities for improvement.

Following in-context immersions, pilots walked designers through an end-to-end journey of their interaction with the system. Having this uninterrupted time to interrogate the workings and use of the EFB, allowed for a deeper level of insight into the system, ease of operation, functionality, content and the relationship between the EFB itself and other internal and third-party systems. Captain Martin Louw, Managing Executive for Aviation at Nacelle, emphasised that: "there is a lot of terminology and one has to have a really deep understanding of various factors and their effects. This is one of the things with which developers battle most. However, be open to letting the pilots help you and they will!"

In addition, as pointed out by Johann Bruwer: "the EFB must support business rules and should be integrated with operational systems to streamline safety, training, reporting and data procedures." Therefore, a broader framework of thinking was required in the development of the new Comair EFB. Nacelle continues to collaborate with the aviation community to deliver on its promise of elevating experiences and in early 2020 will be releasing the re-platformed and newly designed EFB for Comair. ✈



For more information please visit the website: www.nacelleaviation.com

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This month's cover picture was taken at the recent Experimental Aircraft Association (EAA) Sun 'n Fun weekend staged at the Brits Flying Club over the weekend 8 to 10 November 2019. The aircraft is a Long-EZ owned and flown by Dave Lister. The Rutan Model 61 Long-EZ is a homebuilt aircraft with a canard layout designed by Burt Rutan's Rutan Aircraft Factory. It is derived from the VariEze, which was first offered to homebuilders in 1976. Athol Franz took this picture through the open window of his Cessna 182, which is the ideal camera ship for air-to-air photography. Athol used his Canon 7D fitted with an 18 to 200 mm lens at focal length 28 mm. The exposure was f8 at 1/160sec, ISO 200.



Picture of the month



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FACT FILE

Bell 360 Invictus

By Divan Muller

In 2018, the US Army initiated the Future Attack Reconnaissance Aircraft (FARA) programme, with the intention of finding a replacement for its retired Bell OH-58 Kiowa scout helicopters. Five competing designs have been proposed by American helicopter manufacturers. One of these, unveiled by Bell on 1 October this year, is the 360 Invictus.

Although still under development, we know that the helicopter will have a tandem cockpit, fully articulated rotor head design, lift-sharing wings and a digital fly-by-wire flight control system. A Modular Open Systems' Approach (MOSA) ensures that the helicopter can easily be upgraded in the future. The Invictus is designed to fly at speeds exceeding 180 knots, hover out of ground effect at 4 000 feet in 33 °C and to carry a payload of up to 635 kg. Its combat radius is 135 nm with more than 90 minutes 'time on station.'

In addition to missiles or rockets, the 360 will be armed with a 20 mm cannon. Only time will tell whether this remarkable-looking helicopter will be selected by the US Army, which aims to have the successful FARA candidate in service by 2030. 🚁

Bell 360 Invictus



DID YOU KNOW?

The Invictus is based on the Bell 525 Relentless medium-lift helicopter.

The Invictus looks somewhat similar to the Boeing-Sikorsky RAH-66 Comanche of the 1990s, which interestingly enough, was also intended to replace the US Army's OH-58s, but the programme was cancelled.



Embraer signs \$1.4 billion business jet deal with Flexjet

The deal comprises a fleet of Embraer business jets, which includes the recently certified Praetor jets and the Phenom 300. Valued at up to \$1.4 billion at current list prices, this deal was included in the 2019 second quarter backlog, with deliveries starting in the fourth quarter of 2019. With this purchase agreement, Flexjet becomes Embraer's Praetor Fleet Launch Customer. "We are very grateful for Flexjet's renewed commitment to Embraer through this new agreement, which reflects the growth and the strength of our partnership over the past 16 years and symbolises our ongoing support for its journey ahead," said Michael Amalfitano, president and CEO, Embraer Executive Jets. "Flexjet Owners will appreciate and enjoy a truly elevated customer experience in industry-leading aircraft, including the recently certified Praetor jets, which are different by design and disruptive by choice."

The partnership between Embraer and Flexjet dates back to 2003, when Flight Options, which merged with Flexjet in 2015, became the first fractional ownership programme to introduce the Legacy Executive jet into its fleet. Offering customers, a large cabin experience at super-midsize economics allowed Flight Options to serve more customers even better than before, whilst also supporting the company's growth via Embraer's high utilisation, reliable aircraft design.



Embraer Praetor 600

"We are proud to introduce the Praetor jets to the fractional marketplace and make technologically advanced midsize and super-midsize aircraft available to Flexjet Owners," said Michael Silvestro, Flexjet CEO. "This order also represents the longstanding trust we have in Embraer and in its enhanced commitment to support the growth of our programmes and of our partnership with industry-leading business jets."

Flight Options introduced the Phenom 300 into its fractional programme in 2010, receiving Embraer's 100th milestone Phenom 300 in 2012, the first year in which the aircraft became the best-selling light jet. For the seventh consecutive year, the Phenom 300 has been the most delivered light business jet, according to GAMA (General Aviation Manufacturers' Association). Also, according to GAMA data, the Phenom 300 was the only business jet to reach the mark of 500 deliveries in the last decade. ✈️

Hartzell 5-blade composite propellers coming soon for King Air 200 fleet



These custom designed props will be available through Raisbeck Engineering via STC for King Air 200, B200 and B200GT aircraft. This new propeller system, which increases performance across the board, is the first five-blade structural composite propeller certified on the King Air 200 series. Raisbeck Engineering, a leading provider of performance enhancement systems for business and commercial aircraft, is offering the new performance enhancing propellers through its authorised dealer network. The FAA STC is expected to be complete in November 2019.

Raisbeck also offers King Air 200 aircraft owners and operators the option of an aluminium four-blade swept Hartzell-designed propeller, which is aerodynamically designed to provide more thrust with less noise. Raisbeck is now taking orders for the composite five-blade swept propeller. King Air 200 series owners and operators are encouraged to contact Raisbeck or a Raisbeck authorised dealer for more information and pricing. Constructed of structural carbon fibre composite with nickel cobalt leading edges to protect against foreign object damage, the new composite five-blade swept propellers optimise airfoil efficiency allowing for a larger 96-inch diameter propeller with less blade tip noise. This next generation of propellers offers King Air operators an average of 48 pounds total weight savings versus OEM installed propellers. The propeller also features unlimited blade life, thereby lowering maintenance and overhaul costs.

Hartzell Propeller utilises the strength of lightweight structural composites and robotic manufacturing technologies to optimise propeller performance in all flight phases. It designs next-generation propellers with innovative 'blended airfoil' technology and manufactures them with revolutionary machining centres, robotics and custom resin transfer moulding curing stations. Hartzell Propeller and its sister company, Hartzell Engine Technologies LLC, form the general aviation business unit of Tailwind Technologies Inc. ✈️

NBAA-BACE 2019 in Las Vegas

NBAA team



Urban mobility progress

Discussions about urban air mobility (UAM) and electrically powered vertical take-off and landing (eVTOL) aircraft dominated the forward-thinking 2019 NBAA-BACE in Las Vegas. Whilst some urban air taxis appear nearly ready for flight, they all currently lack a key capability that many stakeholders believe is imperative to their success: the ability to fly autonomously, without human intervention. Whilst industry focus has primarily centred on autonomous applications for UAM and unmanned aircraft systems (UAS), work is also underway for implementing autonomous functions in manned aircraft.

"We are focusing on two specific applications, single pilot operations and urban mobility," said Cedric Cocaud, chief engineer at A3, the Silicon Valley-based innovation centre for Airbus. "That is not only about putting sensors, computers and software onboard; it is about the ecosystem around the vehicle, including ground infrastructure, the operator and the customer experience."

As with most people with an interest in aviation and its future, I figured I had a working knowledge of the basics. Skyports would be added to building rooftops where sophisticated autonomous flying machines would whisk passengers across the city in minutes all the while thumbing their noses at the wretches trapped in cars in the clogged streets below. Sounds pretty appealing, but at this point most of the discussion has been about the safe operation of fleets of eVTOLs flitting about our major cities.

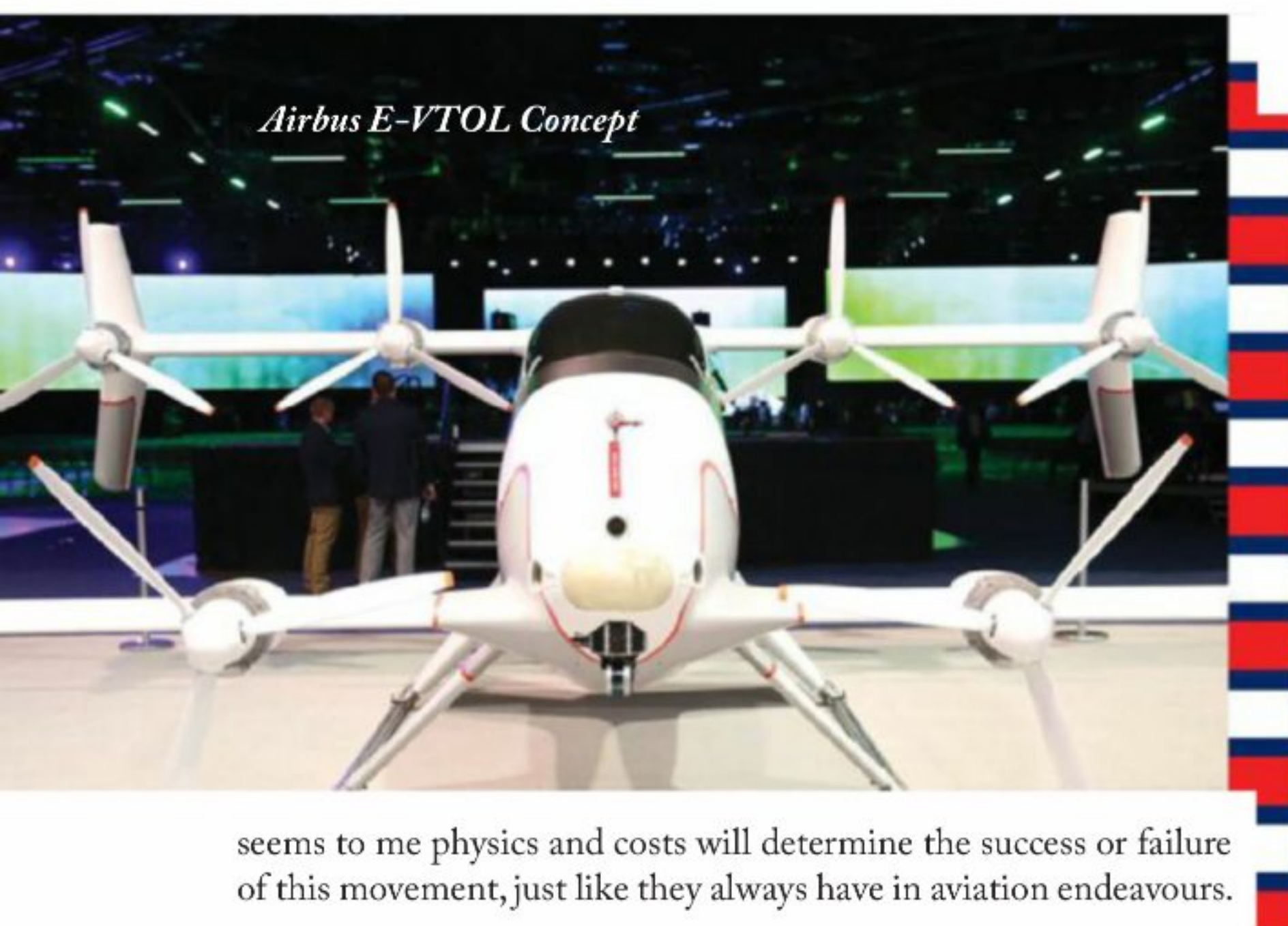
Uber Elevate's head of aviation Eric Allison says that stuff is all but a 'slam dunk' (success will soon be achieved) and his company's now

looking at how human beings fit into the concept. Allison provided a promotional video played at the end of his presentation that certainly gave the audience pause for thought. The video followed a young woman on a typical urban journey involving an aircraft and was meant to show how Uber's phone app seamlessly integrated her into the system to get her where she was going. She started out in a self-driving car before getting on a bicycle to ride to a transit station where a bus or a train finally got her to the skyport. Then it was on to the eVTOL for a few minutes to the next skyport where she presumably faced a variation of the same staccato of ground trips before collapsing at her destination.

The other eye-opener was the hardware on display. Certainly, there are some nifty machines being developed for the job, but with one exception they all look rather flimsy. These new eVTOL aircraft are going to perform dozens of cycles each day in some pretty challenging circumstances and the consequences of component failure within this environment are intolerably high. They need to be tough, durable and virtually perfectly reliable.

Bell Helicopters knows something about moving people and cargo vertically therefore this company's understanding of urban mobility aircraft is both telling and ominous. The Bell Nexus ducted fan aircraft is enormous. The six fans are about seven feet in diameter and they are powered by a fuselage-mounted turbine generator. It's complex, heavy and looks pretty expensive to buy and operate. It's as big as the biggest single-rotor helicopters, which can carry more than a dozen people, but Nexus would carry just five passengers. Perhaps there are some breakthroughs ahead that will tackle these issues, but it





Airbus E-VTOL Concept

seems to me physics and costs will determine the success or failure of this movement, just like they always have in aviation endeavours.

LearJet's last gasp?

Almost lost in the noise of launching even bigger, faster and more luxurious business jets at NBAA, was a progress report on a reheated version of the nameplate that arguably took the business jet business mainstream. Bombardier, which owns LearJet, announced in July that it was launching an updated and less expensive version of the existing airframe with fewer seats and the company gave an update at this exhibition. The LearJet 75 Liberty will have a new interior, but no APU or lavatory sink to get the cost in line with the CJ4 and Phenom 300. Like most industries, aviation lives or dies by innovation and investment in new products and LearJet hasn't had a clean-sheet introduction in years. The Liberty might coax a few more sales but it's not a big enough platform to support the weight of an iconic airplane maker like Lear.

Honda displayed first medivac installation

A HondaJet Elite owned by Wing Spirit was displayed in a medevac configuration as an air ambulance. The charter company based in Hawaii said "We are pleased to announce the installation of the first medevac configuration on the HondaJet. We are confident the aircraft's size, efficiency, speed and cabin comfort are well-suited to these special missions in the Hawaiian Islands," Honda Aircraft Company continues to strengthen its service and support capabilities as it expands its service network around the world. The company announced the addition of a north-eastern United States' service centre in Wilmington, Delaware. flyADVANCED is an FAA 145 repair station with airframe, power plant and radio ratings, Garmin Dealer and Service Centre and mobile repair capability.

Embraer wins \$1.4 billion Flexjet contract

A firm order placed by fractional ownership company Flexjet for US\$1.4 billion as an order for 64 Embraer Phenom 300Es and Praetor 500/600s, making it the fleet launch customer for the Praetor. Deliveries to Flexjet will start within a month when the operator will also convert its Legacy 450 fleet into Praetor 500s under an FAA-approved modification. Delivery of Embraer Praetors will mark the fourth time that Flexjet has introduced new Embraer aircraft to the fractional market. Previous introductions were the Legacy 600 in 2003, Phenom 300 in 2010 and Legacy 450 in 2016. Its current Embraer contingent includes Phenom 300s and Legacy 450s. In anticipation of this order, Flexjet has been engaged in recruiting pilots this year and recently met its 2019 goal of hiring 175 new pilots," the fractional provider said.

Piaggio exhibits at NBAA

The new Avanti EVO was showcased by Italian manufacturer Piaggio. Designed and manufactured at the aerospace excellence centre in Villanova d'Albenga in north-western Italy, the aircraft on display represented the latest generation of the legendary P.180, a



Airbus Helicopter cabin mock-up

twin-engine turboprop that combines style, efficiency, performance and economical fuel consumption. Piaggio says this advanced model is perfect for business and is already operated for special missions by armed forces, government agencies and private operators, in numerous applications.

With a balance sheet reflecting \$930 million in orders and commitments, Piaggio also announced the impending launch of a public tender for the insolvent company, a new agreement for the sale of at least 10 Avanti Evo turboprop twins and plans to introduce two corporate shuttle versions of the eight-passenger aircraft. The figure represents close to \$300 million in contracts from its engine and customer-support units, as well as new aircraft and other contracts anticipated by year-end to total some \$630 million.

Tecnam BoP2012 Traveller debut at NBAA

At its first public appearance at NBAA the P2012 Traveller, the industry's most advanced and versatile twin engine piston won orders for eleven aircraft in just two days. Walter Da Costa, Tecnam's Global Sales and Marketing Director reported he signed contracts at NBAA-BACE with Naseer Ismail, CEO of TAMIFIELD (Pty) Ltd a member of the AMRHO Group from South Africa, who ordered six P2012s with the option of an additional twelve. Also, Capt. Alfredo Andres Ortiz Osoria, CEO of Charter Express SAS from Columbia ordered five P2012s with the option of an additional five. The first few P2012 Travellers left Tecnam's Headquarters in Capua, Italy and arrived at Cape Air's base in Hyannis, MA at the end of September. This delivery flight was led by Giovanni Pascale, grandson of the two founders, Luigi and Giovanni Pascale. They arrived in time to celebrate the company's 30-year anniversary.

The Tecnam P2012 is powered by two 375 HP turbo-charged Lycoming engines and features a modern design with state-of-the-art equipment, allowing single-pilot operations depending on individual country regulations. This aircraft offers high efficiency and low maintenance costs by design with its simple and easily accessed airframe and systems. These include fixed landing gear, robust interiors and easy-to-replace parts. These attributes and many more make it the ideal aircraft for regional airlines.

The arrival of the next-generation 11-seat, twin-engine P2012 Traveller is highly anticipated by a large number of airlines around the world which have been demanding a replacement for the many hundreds of 'heritage' aeroplanes in the FAR23 / CS23 category. This aircraft is set to open many profitable opportunities in Short Haul transportation and is revolutionising the piston engines' sector. Already established as a leader in both the Flight Training and Private General Aviation sectors, Tecnam's P2012 Traveller will undoubtedly herald very similar success for Tecnam in the very competitive commuter airline market.

Honda medivac



Pilatus NGX – third generation PC-12

For the third iteration to its venerable PC-12 single-engine turboprop (SETP), Swiss airframer Pilatus Aircraft unveiled a new variant that includes a complete redesign of the cabin, new avionics and a new variant of the Pratt & Whitney Canada (P&WC) PT6A powerplant found in the first two generations of the airplane. Under development for more than three years, the NGX began flight testing in December 2017 and is expected to receive FAA and European Union Aviation Safety Agency certification in December 2019. A detailed feature on the new Pilatus PC-12 NGX is featured within this edition of African Pilot.

Textron's Cessna Denali's first flight expected in 2020

With five development engines assembled and more than 1,600 hours of combined operation between engine test hours, GE Aviation's new Catalyst turboprop engine is progressing toward a flying testbed for the launch application on Denali. However, GE officials confirmed that the Catalyst engine will not be delivered until sometime in 2020. Catalyst testing milestones include more than 1,000 engine cycles with hot starts and cold starts in temperatures between -65- and 125-degrees Fahrenheit. It also reached FL410 in an altitude chamber and the first engine certification test-PT loss of load-was completed in October. Two component certification tests have also been completed: GGT overspeed and HPC overspeed.

Global 5500 range increase

Canada's Bombardier announced that the Global 5500 will have slightly greater range than first anticipated. The new member of the Global family will fly 200 nm further-to 5,900 nm at Mach 0.85. "We are thrilled to offer this extended range to our customers," said Bombardier Aviation president David Coleal. "The rigor and innovation behind our Global 5500 aircraft design and test programme have allowed us to deliver enhanced performance without compromise. Not only are we standing by our commitment of certifying and bringing to market an exceptional aircraft on time, but we are also exceeding expectations along the way." Coleal added



Learjet 75 Liberty



the 5500's extended range was discovered during the flight-test programme involving two flight-test aircraft.

Gulfstream's new G700 business jet

At NBAA, Gulfstream Aerospace unveiled its G700 as its newest flagship and announced Qatar Executive as the launch customer, whilst Flexjet will be the first North American fleet customer. Gulfstream's latest business jet combines the best features of its G650ER and recently certified G500/600, resulting in a \$75 million twinjet with an NBAA IFR range of at least 7,500 nm.

The G700 has a five-living-area cabin. The two first-test aircraft (T1 and T2) have already rolled off the company's production line in Savannah. The company will be conducting several months of ground tests before a planned first flight in the first half of 2020 and service entry of the G700 is expected to follow in 2022.

Though touted as an all-new airplane, the fly-by-wire G700 is a 10-foot stretched derivative of the G650, with which it also shares the same nose and wing. The jet also borrows the G500/600's Symmetry flight deck, whilst adding a redesigned tail with lower height for easier hangar access, swoopy winglets, as well as new Rolls-Royce Pearl 700 engines. The G700 will have a maximum take-off weight of 107,600 pounds and a maximum fuel load of 49,400. Balanced field length at MTOW is 6,250 feet, whilst the landing distance is 2,500 feet at an as-yet-unspecified 'typical landing weight.'

Boeing announces orders for two BBJ 787-9 Dreamliners

Boeing Business Jets has revealed orders for two BBJ 787-9 Dreamliners, placed in August by a single undisclosed customer, with a combined list price value of \$564 million. This brings sales for the VIP variant of the all-composite widebody to 16. Offering one of the most spacious cabins in the industry, the BBJ 787-9 has 2,775 square feet, providing 'a large canvas for

Piaggio Avanti EVO



Bombardier Global 5500



a range of interior design options to ensure ultimate comfort on short or long-distance flights.'

It also offers amenities such as larger windows, a lower cabin altitude, smooth ride technology, cleaner and higher humidity air and a quieter cabin compared with other BBJ models. According to Boeing, the 787 Dreamliner is the fastest selling widebody airplane in history, with orders for more than 1,450 from some 80 customers on six continents.

Airbus ACJ launches iflyACJ website

Airbus Corporate Jets (ACJ) launched the iflyACJ.com website, allowing VIP travellers to easily plan their world travel with ACJ charter operators. The new website will appeal to VIP travellers, because it groups together in a single place information about the Airbus corporate jet offerings of 12 operators; such as details of their spacious cabins, characteristics and tailored on-board services. Its simplicity enables users to find details about each ACJ VIP charter offering in a single click.

Customers can then select the desired ACJ operator and be taken seamlessly to the website of their chosen ACJ charter provider, allowing them to book securely and with confidence at no extra cost. ACJ operator fleets include the ACJ318, ACJ319, ACJ320 and ACJ340, all of which deliver impressive combinations of comfort, range and reliability.

Wrapping up NBAA 2019

The three-day exhibition certainly lived up to its promise of driving change in a rapidly changing and evolving industry. New modes of transport such as unmanned aircraft systems (UAS) and urban air mobility (UAM) vehicles formed a prominent part of this year's convention.

Sustainability in business aviation was a dominant theme throughout the show, with around 24 aircraft fuelling en route with SAF (Sustainable Alternative Fuels), a non-fossil power source that can reduce aviation's carbon lifecycle emissions by up to 80 percent.

Gulfstream G700



Every visiting aircraft that refuelled at and departed from Henderson Executive Airport did so on SAF. ✈️

Tecnam P2012 Traveller



Pilatus NGX

Airbus ACJ



Bell E-VTOL concept



Pilatus reveals the PC-12 NGX

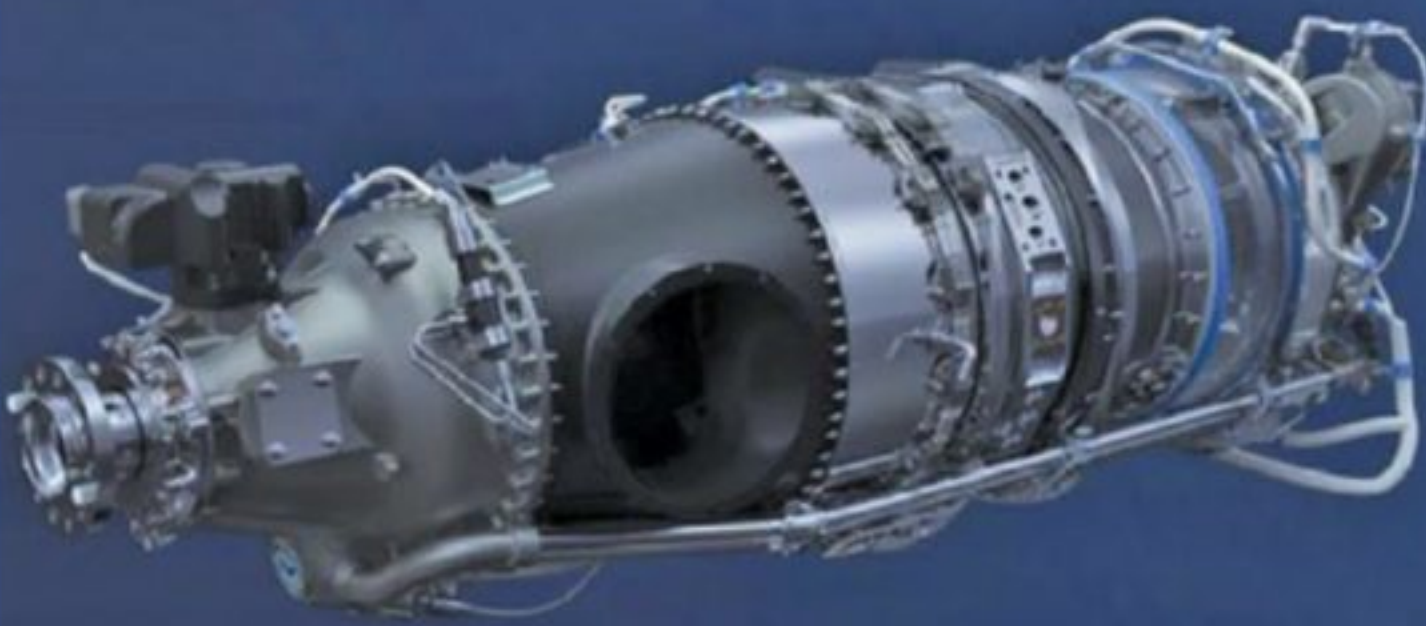


Pilatus PC-12 NGX cabin



Pilatus PC-12 NGX cockpit

New Pratt & Whitney E-Series engine



At the National Business Aviation Convention & Exhibition (NBAA-BACE) in Las Vegas on Tuesday 22 October, Pilatus took the wraps off the industry's most advanced and versatile single engine turboprop the PC-12 NGX. The brand-new PC-12 NGX incorporates an improved engine, smarter avionics and a completely redesigned cabin with larger windows, making this third generation of the PC-12 airframe the most advanced single-engine turboprop ever. Building on the experience gathered from the worldwide PC-12 fleet of over 1,700 aircraft with more than seven million flight hours plus Pilatus industry-leading support, the new PC-12 NGX brings the latest technology to the turboprop market.

Proven engine technology with digital control

Single-engine turboprop operation demands a proven powerplant: at the heart of the new PC-12 NGX is the PT6E-67XP turboprop engine by Pratt & Whitney Canada. This improved engine features an Electronic Propeller and Engine Control System including Full Authority Digital Engine Control (FADEC), a worldwide first in this market segment. In addition, the new propeller low speed mode results in a significant reduction in cabin noise for great passenger comfort. The new turboprop engine enables the PC-12 NGX to achieve a maximum cruise speed of 290 knots (537 kilometres per hour). The PC-12 NGX also adds advanced features like Prist®-free fuel operation.

Smart cockpit environment

The PC-12 NGX boasts a range of new features for the pilot: Advanced Cockpit Environment (ACE™) System by Honeywell

as inspired by the PC-24 provides enhanced avionics. In another first for the segment, Pilatus combines the power of a cursor control device with the versatility of a smart touch screen controller in a truly professional flight deck. The digital auto throttle, i.e. automatic thrust adjustment, reduces pilot workload for greater safety and ensures automatic power optimisation in every phase of flight.

New cabin with larger windows

The cabin windows have been enlarged by ten percent to enhance the PC-12 NGX's passenger experience and deliver more natural light. The rectangular shape of the new windows also adapted from the PC-24 and dark windshield surround trim, create a distinctive ramp presence for the PC-12 NGX. The completely redesigned cabin comes in six different BMW Designworks' interiors. The especially developed extremely light passenger seats offer optimum ergonomics with full-recline capability if required. The seats are arranged to provide maximum freedom of movement with more headroom thanks to the redesigned headliner. The air-conditioning system delivers better and quieter air distribution.

Reduced operating cost

With the new PC-12 NGX, scheduled maintenance intervals have been extended to 600 flight hours, which provides significant cost savings. The time-between-overhaul period has also been increased from 4,000 to 5,000 hours, thereby reducing the cost of operating the PC-12 NGX even further, making it the undisputed leader in its class.

Speaking at the presentation in Las Vegas, Markus Bucher, CEO of Pilatus, stated: "We are excited to reveal the new PC-12 NGX today. To maintain the PC-12's leadership in the general aviation marketplace, we continuously seek innovative solutions which benefit the safety, comfort and productivity of our customers. The PC-12 NGX is a showcase for the advanced technology collaboration between Pilatus, Pratt & Whitney Canada, and Honeywell. Together, we took the best, and made it even better. What is more, our customers do not have to wait years to enjoy these benefits; the PC-12 NGX is here today."

Pratt & Whitney launches first integrated electronic propeller and engine control system Together with Pilatus and Honeywell Pratt & Whitney has launched the new PC-12 NGX aircraft,

powered by the new Pratt & Whitney PT6 E-Series engine. It is the first turboprop engine in general aviation to offer a dual channel integrated electronic propeller and engine control system, pushing innovation to a new level. The company is also enhancing its new Eagle Service Plan (ESP) for the PT6 E-Series engine.

The advanced technology behind the PT6 E-Series engine provides a more intuitive way of flying with simplified operations. At the push of a button, the pilot can start and stop the engine while being protected against hot and hung starts. The single lever and integrated electronic propeller and engine control system allows precise engine control by constantly monitoring temperature and torque to provide optimal engine power and performance throughout all phases of flight. In fact, the new turbine design of the PT6E-67XP engine, which powers the Pilatus PC-12 NGX aircraft, allows for quicker climb, greater speed and a 10% increase in power to reach the destination faster.

Since the engine is digitally connected, more than 100 parameters are monitored to allow for predictive analysis of the engine and system operation and proactive maintenance planning. As the electronic engine control (EEC) receives all engine and key aircraft data, it is able to make adjustments to optimise and deliver the right engine power needed throughout the flight.

Once the aircraft lands, all the engine flight data is wirelessly downloaded, providing operators and maintainers valuable new insights into the performance and health of the engine. This allows advanced planning of any maintenance needs, so that customers can maximise their operations and reduce their costs, flying when they need to and for longer periods. Insights gained through the new data maximizes the already high, designed-in engine availability provided by the 600-hour maintenance interval which has been increased from 300 hours and 43% longer time between overhaul (TBO) intervals, which increases to 5,000 hours.

The ESP for the PT6 E-Series engine, transferrable at aircraft sale, has been designed so that owners can benefit from a reduction of at least 15% in hourly engine operating costs. It is a step-change for customers and pilots, delivering an enhanced service level. The new ESP offers the most comprehensive coverage plan, including foreign object damage (FOD) repair and environmental protection. This full protection plan also includes overhaul, scheduled line maintenance, fuel nozzle refurbishment, unscheduled hot section inspection, basic unscheduled repair, accessory repair and more.

Customers who enrol in the ESP can benefit even more from the engine's digital connectivity. While owners, pilots and maintainers have access to the engine's performance data, the ESP PT6 E-Series takes it one step further. The data will be sent for trend monitoring and, if required, for troubleshooting. Armed with this information, Pratt & Whitney's predictive analytics team of dedicated engineers and data analysts will provide personalised, high-tech proactive recommendations to equip customers and maintainers with new insights about their engine and the latest technical information to maximise the engine's time on airframe and reduce operating costs.

With no minimum flying hour thresholds and a dedicated single point of contact, the new ESP makes the flying experience simple all around. Customers can take advantage of the ESP PT6 E-Series plan when they purchase the aircraft through their Pilatus dealer. ✈️



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AP-2019/02



CESSNA SKYWAGON

owners put Hartzell's new
Voyager Propeller to the test

Pilot Mike Todd shares his first impressions
of the Voyager propeller

At EAA AirVenture Oshkosh 2019, Hartzell Propeller debuted a new propeller called the Voyager. This is an upgrade for the Cessna A185E/F Skywagon and AgCarryall aircraft. The new swept-tip aluminium three-blade, 86-inch propeller was custom-designed for the back-country aircraft, which are known for stellar bush performance in the most inhospitable terrain. After the Voyager was introduced, Hartzell asked several pilots in the Skywagon community to install the new propeller on their airplanes and provide feedback.

Pilot Mike Todd of Western Washington was pleased to share his initial impressions of the Voyager.

Mike Todd is a retired 747 Captain who now flies 'just for fun' throughout Washington, Idaho, Montana and beyond. His backyard airstrip sees plenty of action from his Cessna 180, the 'Silver Bullet,' which he has owned for 25 years. Mike says he has used several different propellers on his airplane in the past and was interested to see how the Voyager measured up. "One of the reasons this propeller appealed to me was the idea that it was developed specifically for the type of use it will see on the Skywagon," Mike said.

After flying behind the Voyager for a few weeks, Mike reported back to the Hartzell Propeller team. "The design hit a sweet spot," he said. "Overall, the Voyager compares very favourably with the other propellers I have used on the airplane. The aircraft accelerates better on take-off, climbs better and cruises faster than with any other propellers I have tried," he said. He added, "According to my neighbours, the Voyager is considerably less noisy than other propellers I have used."

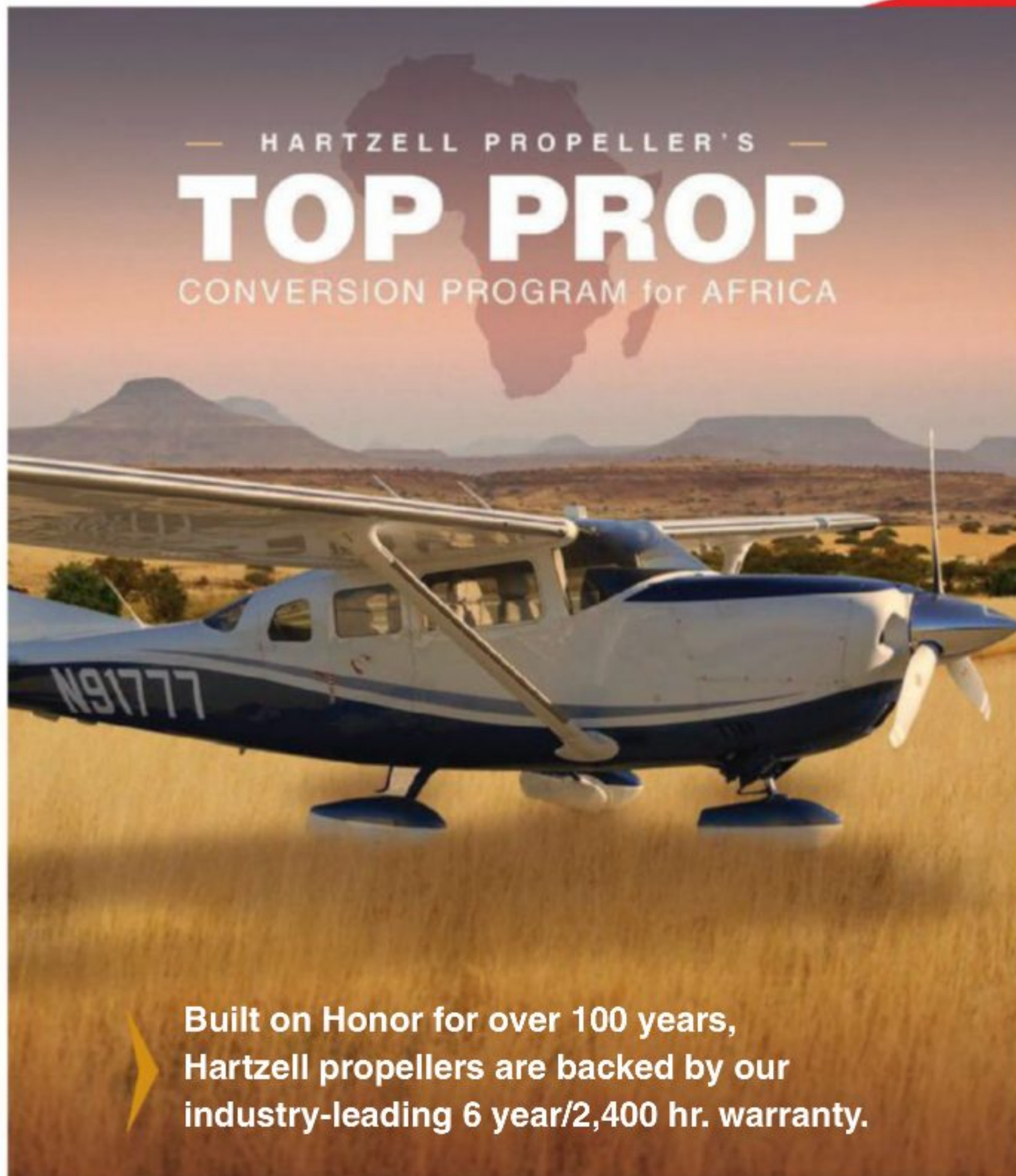
Another factor that impressed Mike was the cruise performance at lower power settings, where he is looking to get the best range out of his short-range fuel tanks. "I definitely see better speed at lower fuel flows than before," he said. Mike noted that the most important difference to him was the more robust design of the Voyager propeller and spinner compared with other propellers, which Mike says makes it easier to stay within the centre of gravity envelope when loading his 180.

**“The Voyager is far and away
the best performing prop
I have ever had on my airplane”**

The Hartzell Voyager propeller is now available for immediate delivery and installation on A185E/F Skywagon and AgCarryall aircraft. Pricing includes a polished spinner and all STC documentation. The scimitar propeller can be worked down to 84 inches in diameter if needed. In addition, the propeller has a 2,400-hour, six-year TBO and the longest propeller warranty in the business, all the way through the first overhaul. ✈

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Garmin® revolutionises the aviation industry with the first Autoland system

On 30 October, Garmin announced a revolution in general aviation – the first Garmin Autoland system. In the event of an emergency, Autoland will control and land the aircraft without human intervention. The Autoland system determines the most optimal airport and runway, taking into account factors such as weather, terrain, obstacles and aircraft performance statistics. Autoland brings peace of mind to air travel and will soon be available on select general aviation aircraft with the Garmin G3000® integrated flight deck.

In the event of an emergency, the pilot or passengers on board the aircraft can activate Autoland to land the aircraft with a simple press of a dedicated button. Autoland can also activate automatically if the system determines it is necessary. Once activated, the system calculates a flight plan to the most suitable airport, initiates an approach to the runway and automatically lands the aircraft. During an Autoland activation, the system takes into account a breadth of information and criteria. The availability of a GPS approach with lateral and vertical guidance to the runway is also required when the system is considering various airports and runways. Even further, the system will automatically communicate with air traffic control (ATC), advising controllers and pilots operating near the aircraft of its location and its intentions.

Throughout an Autoland activation, the system provides simple visual and verbal communications in plain language so passengers in the aircraft know what to expect. The flight displays show the aircraft's location on a map alongside information such as the destination airport, estimated time of arrival, distance to the destination airport and fuel remaining. Airspeed, altitude and aircraft heading are also labelled in an easy-to-understand format. Passengers also have the option to communicate with ATC by following instructions on the display using the touchscreen interface on the flight deck.

The Garmin Autothrottle system is used to automatically manage aircraft speed, engine performance and engine power so the aircraft can climb, descend or maintain altitude as needed during an Autoland activation. On approach to land, the system initiates a controlled descent to the airport. If the aircraft needs additional time to descend or slow down during the approach, the Autoland system initiates a standard holding procedure and extends the landing gear and flaps. Once in landing configuration, the aircraft begins its descent to the runway. On the runway, automatic braking is applied whilst tracking the runway centreline to bring the aircraft to a full stop. Engine shutdown is also automated so occupants can

safely exit the aircraft. At any time, a pilot can easily deactivate an Autoland activation. With a single press of the 'AP' autopilot key on the autopilot controller or the autopilot disconnect button on the controls, an Autoland activation can be cancelled. The flight display shows a message that confirms Autoland has been deactivated and in the event of an accidental deactivation, the system shows passengers how to reactivate Autoland if needed.

Garmin Autonomi™, a family of automated flight technologies, encompasses Autoland, Emergency Descent Mode (EDM) and Electronic Stability and Protection (ESP). These technologies add to the safety enhancing tools and capabilities of a Garmin-equipped flight deck. For example, in the event an aircraft loses pressurisation, EDM is capable of automatically descending the aircraft to a pre-set altitude without pilot intervention to help avert hypoxic situations.

ESP further enhances the Autonomi suite by working to assist the pilot in avoiding unintentional flight attitudes beyond that for normal flight. ESP works in the background whilst the pilot is hand flying the aircraft to help pilots avoid inadvertent flight attitudes or bank angles. Should the pilot become inattentive whilst hand-flying the aircraft and exceed pre-determined pitch, roll or airspeed limitations, Garmin ESP activates and the pilot will feel pressure on the flight controls that guide him or her back to a recommended flight limit. Autoland will soon be available as part of the G3000 integrated flight deck on the Cirrus Vision Jet and the Piper M600, pending Federal Aviation Administration (FAA) certification. ✈

For additional information regarding the Garmin Autonomi family of autonomously activated flight technologies, visit
www.garmin.com/Autonomi





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Solo at 16 with 16 hours

By Johan Botes

An interview with 16-year-old Vaughn Naudé, a student pilot from Central Flying Academy who completed his first solo flight with 16 hours total time.

Q. Completing your first solo flight with only 16 hours at the age of 16 is not only a wonderful achievement, but something that was not possible a few years ago. What would you say were the motivating factors behind your achievement?

VN. The fact that my father and both grandfathers were pilots, greatly motivated my recent achievement. My entire family has always been very supportive of my passion for aviation. The fact that I am privileged enough to be able to fly solo at my age, is simply a blessing from God Almighty. So, when the opportunity presented itself, there was no doubt in my mind that I would be able to achieve my solo if I worked hard at my flying.



Q. Once you have obtained your Private Pilot's Licence, what will you be doing next?

VN. After completing my PPL, I will definitely be planning on completing my Commercial Licence, Instructor's Rating, ATPL and should the opportunity arise, aerobatic and formation flying ratings.

Q. Where do you see yourself in ten years from now, from a career perspective?

VN. In ten years from now I plan to have built some aerobatic / formation experience and I would like to partake in aerobatic competitions and airshows internationally. At the moment with the aviation industry the way it is, aerobatic flying will not be able to sustain me as an individual. Therefore, I will probably choose a career in an airline or charter company, flying either small to mid-size turboprops, or large airliners depending on the opportunities at the time.

Q. *What advice would you give to aspiring young pilots?*

VN. Preparation is a huge part of success; starting to gain a general knowledge about aviation, even if you haven't yet started with training for your pilot licence, will be very valuable for your future.

Q. *Will you be sharing your passion with others by becoming an instructor and teaching others to fly?*

VN. Instruction is definitely part of the plan for my future. I believe it is important to share aviation and instruction would be a small part of 'doing my part' in terms of spreading aviation and the passion for flying.

Q. *Do you have an all-time favourite aircraft?*

VN. Choosing one would be nearly impossible. However, my favourites are the Beechcraft Bonanza, Extra 330, DC-4, P-38 Lightning and the F/A-18 Super Hornet.

Q. *What was the best part about going solo for you?*

VN. It is difficult to understand or describe the passion or drive for flying or aviation in general. It is the combination of sounds, vibrations and smells that the aircraft presents as you can hear the airflow and feel every bump and shake in the air. I can honestly say that I enjoyed the entire experience, from filling in the paperwork before and after, to the slightly stressful check ride with the instructor before the actual flight, to the fire brigade spraying me down afterwards.

Q. *Why did you choose Central Flying Academy?*

VN. Central Flying Academy (CFA) is a very organised, well-structured flight school that is situated conveniently at Rand Airport, Johannesburg. The training environment, considering

the airport and aircraft used, makes it friendly for students and more experienced pilots alike. I have enjoyed the time I have spent training there and I plan on completing my licences and even instructing at CFA in years to come.

Q. *How did you become interested in flying?*

VN. I was born into a family of aviators; I think the bug was 'in my blood' from the outset. I honestly don't remember a specific point in time at which I decided I wanted to fly, but the desire was always there.

Q. *In a single paragraph (or sentence), please share with us the single most memorable moment of your ab-initio training.*

VN. The most memorable part of my training so far would probably be my first landing, knowing that it's the most challenging part of any normal and uneventful flight.

Q. *Do you have a favourite aviation quote? An example would be Karl Jensen's quote: "If you have flown solo, you'll understand why birds sing."*

VN. A quote that has stuck with me and I am sure many other pilots can relate to is: 'Once you have tasted flight, you will forever walk the Earth with your eyes turned skyward. For there you have been, and there you will long to return.' - Leonardo Da Vinci.

Q. *Is there anything else you would like to say?*

VN. I would like to thank everyone at the CFA team who made this happen, who made my dream come true. Thank you to Johan Botes and the rest of the African Pilot team for making it possible to have my story in the best aviation magazine in South Africa which I have literally been paging through since before I could read. It is a huge honour for me to be part of this December edition and I wish all the best to the CFA and African Pilot teams. ✈



NAMES^{TO} REMEMBER

BY DIVAN MULLER



James McDonnell

James Smith McDonnell, also known as 'Mr Mac', was born on 9 April 1899 in Denver, Colorado, in the USA. He graduated with honours in physics from Princeton University in 1921. He then immediately enrolled at the Massachusetts Institute of Technology (MIT), from where he later graduated with a master's degree in science, specialising in aeronautical engineering. Meanwhile, he also earned his pilot's licence with the US Army's Reserve Officers' Training Corps.

Over the next few years, he worked for the Huff Daland Airplane Company as a draftsman, Consolidated Aircraft Company as a stress analyst and the Ford Motor Company as an aeronautical engineer. At Ford, McDonnell contributed to the development of the company's famous Trimotor. He also designed a small monoplane, which failed commercially due to the Great Depression. In the 1930s, McDonnell worked for the Great Lakes' Aircraft Company and later the Glenn L. Martin Company.

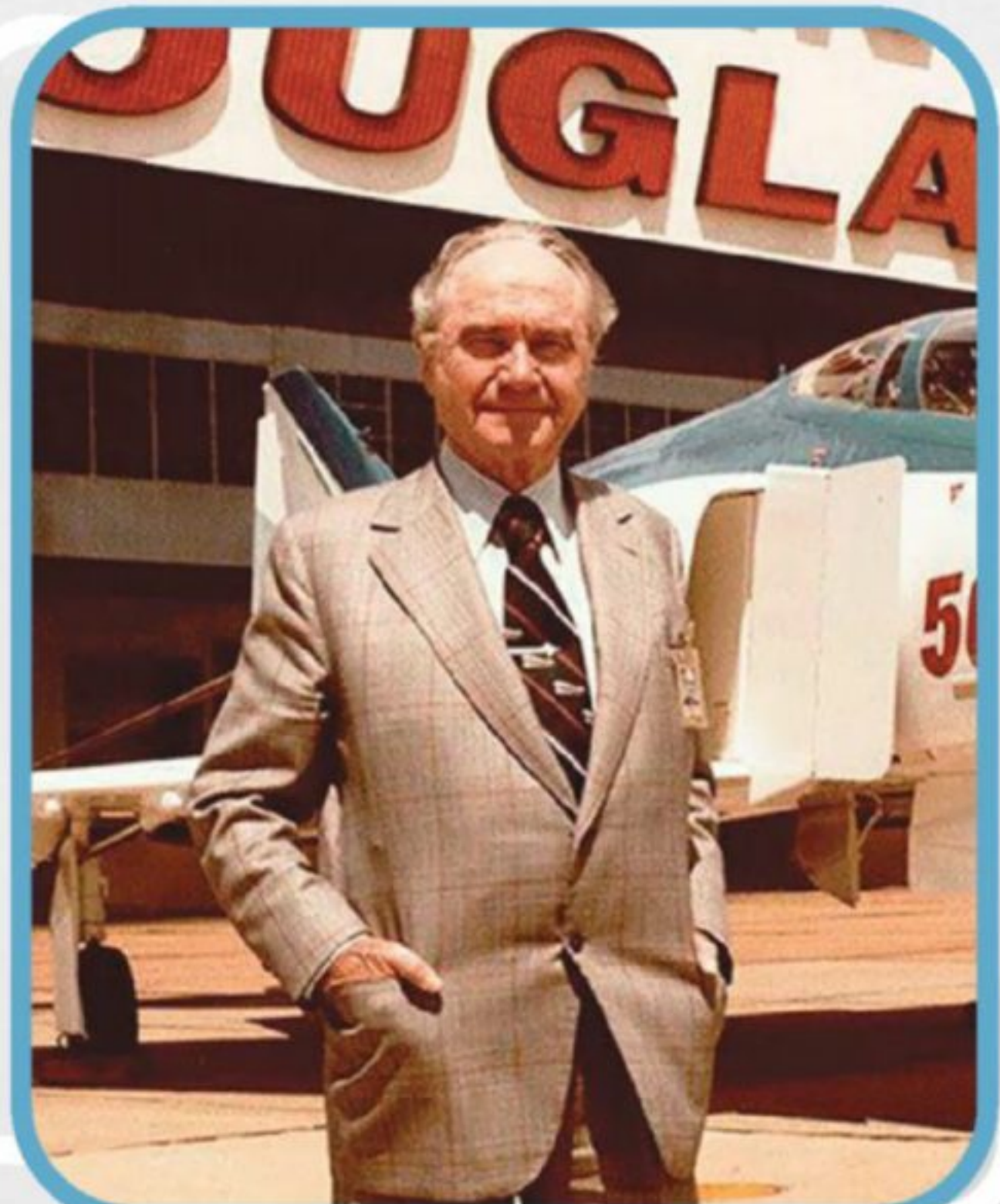
Finally, in July 1939, McDonnell founded his own company, the McDonnell Aircraft Corporation. McDonnell's company manufactured parts for other aircraft manufacturers during World War II in the early 1940s, but the company quickly grew to become a major producer of military aircraft. Some of the more notable aircraft designed by McDonnell Aircraft included the F2H Banshee, the F-101 Voodoo and the F-4 Phantom II. The company also proved to be instrumental in NASA's (National Aeronautical and Space Administration) Mercury and Gemini programmes.

In 1967, McDonnell Aircraft Corporation merged with Douglas Aircraft Company to form McDonnell Douglas. James McDonnell served as CEO and chairman of the board throughout the 1970s, with the company producing several very successful aircraft types, such as the MD-80 airliner, the F-15 Eagle, the F/A-18 Hornet and KC-10 Extender.

Even in terms of weapons, McDonnell Douglas produced the Harpoon anti-ship missile and famous Tomahawk cruise missile. In 1977, James McDonnell was inducted into the National Aviation Hall of Fame.

He died on 22 August 1980 at the age of 81.

What a track record! ✈️



EVENTS CALENDAR 2019

2019	Event	Venue	Contact
30 November - 1 December	SAC Ace of Base	Vereeniging Airfield	Annie Boon chung@mweb.co.za

EVENTS CALENDAR 2020

2019	Event	Venue	Contact
18 - 19 January	SAC Gauteng Regionals and Judges Trophy	Vereeniging Airfield	Annie Boon chung@mweb.co.za
25 January	SAPFA Rand Airport Challenge	Rand Airport Germiston	Frank Eckard 083 269 1516 frank.eckard@mweb.co.za
25 January	SAPFA AGM	Rand Airport	Rob Jonkers 082 804 7032 rob@aerosud.co.za
1 February	SAPFA Speed Rally	Klerksdorp Airfield	Jonty Esser 082 855 9435 jonty@promptroofing.co.za
29 February	SAPFA Rally Navigation Training Course	TBA	Mary de Klerk 084 880 9000 mary@expandingbranding.co.za
4 - 5 March	Aviation Africa Summit and Exhibition 2020	Addis Ababa	+44 (0) 170 253 0000 david.evans@africanaerospace.aero
4 - 8 March	IADE International Aerospace & Defence exhibition	Tunisia	ilouati@expomediatusnia.com www.expomediatusnia.com
7 March	SAPFA Brakpan Fun Rally	Brakpan Airfield	Frank Eckard 083 269 1516 frank.eckard@mweb.co.za
7 - 8 March	SAC KZN Regionals	Ladysmith Airfield	Annie Boon chung@mweb.co.za
21 March	SAPFA Speed Rally	Heidelberg Airfield	Jonty Esser 082 855 9435 jonty@promptroofing.co.za
21 March	The Airplane Factory breakfast fly-in	Tedderfield Airfield	Shanelle McKechnie 066 224 2128 shanelle@airplanefactory.co.za

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Dassault's Mirage III

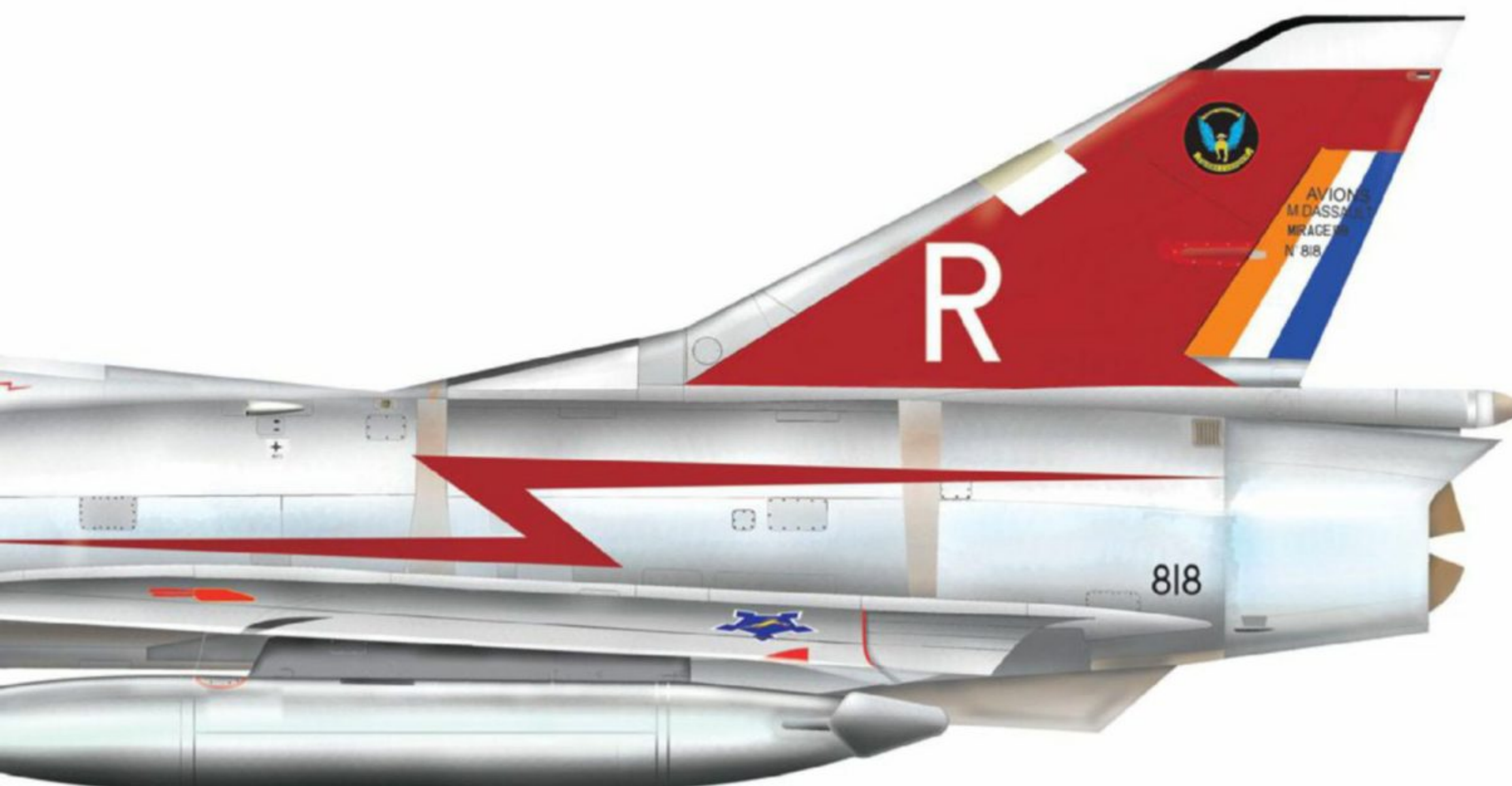
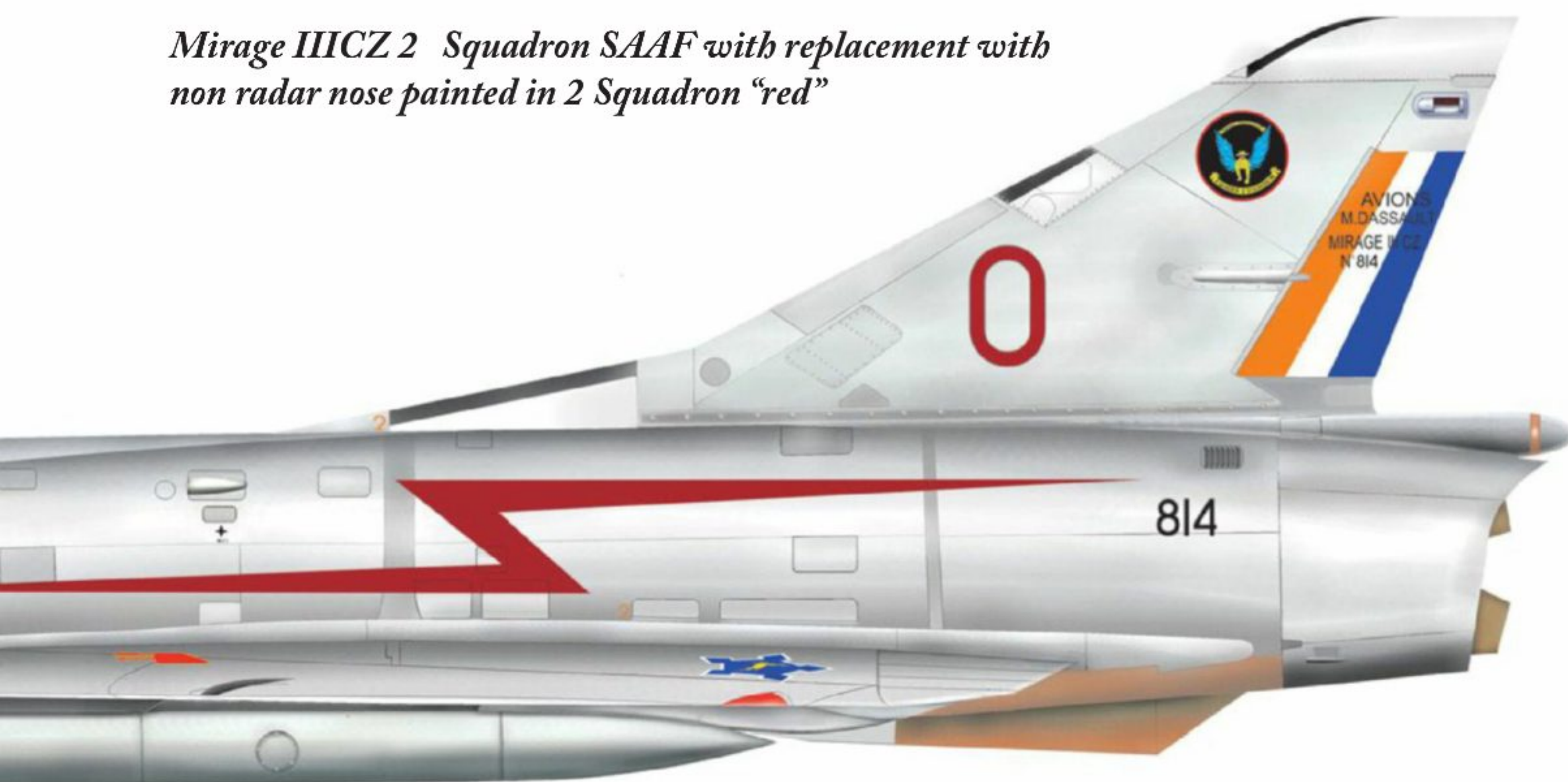
By Divan Muller



Mirage IIIBZ 818 two seater with original call sign "R" on tail.



*Mirage IIICZ 2 Squadron SAAF with replacement with
non radar nose painted in 2 Squadron "red"*



Aidan Owen

Illustrations by Aidan Owen

Blue Flight Illustrations

e-mail: aidanblueflight@gmail.com



Arguably one of the most classically beautiful fighters ever designed, the Mirage III has made its mark in military history, including South African history.

Mirage III formation**Development and variants**

During the early 1950s, in what was arguably the height of the Cold War, the Ministère des Armées, the department which managed the French Armed Forces, conducted a study which led to the realisation of the need for a new fighter type for the Armée de l'Air (AdA – French Air Force). The new aircraft had to be an all-weather fighter, capable of climbing to 60 000 feet in six minutes and able to reach Mach 1.3 in level flight. Dassault Aviation's response to the requirement was its Mystere Delta MD.550. It had a delta-wing configuration and was powered by two Armstrong Siddeley Viper jet engines, as well as a liquid-fuelled rocket motor. The prototype first flew in June 1955. The aircraft was subsequently modified and renamed as the Mirage I. With the use of its rocket, the aircraft could reach Mach 1.6. However, it was soon discovered that the Mirage I was simply too small in size to carry a useful payload. A larger Mirage II was planned, but it was quickly scrapped in favour of a larger, single-engine version which incorporated more advanced design philosophies. This version was designated the Mirage III.

Powered by a Snecma Atar jet engine, the Mirage III prototype completed its maiden flight on 17 November 1956. During the next

year, it received various improvements and modifications, such as the addition of moveable half-cone shock diffusers in its air intakes. Soon enough, it was able to reach Mach 1.8. Suitably impressed, the AdA ordered ten pre-production Mirage IIIs. The first of these flew in May 1958. A few months later, one of these aircraft reached a speed of Mach 2.2. In doing so, the Mirage III became the first European aircraft to reach Mach 2.

In October 1959, the first two-seat Mirage IIIB operational training aircraft completed its first flight. The single-seat Mirage IIIC interceptor, which was developed concurrently, completed its maiden flight one year later. Other variants included the 'E' multirole strike-fighter and 'R' reconnaissance variant. The 'D' was essentially a two-seat version of the E.

Given the tremendous commercial success of the Mirage III, there were numerous subvariants and developments of the aircraft type. The Mirage 5, for example, was simply a Mirage IIIE which had originally been modified for use in the Middle East by the Israeli Air Force (IAF). The Israeli Aircraft Industries' (IAI) Nesher airframe was virtually identical to that of the Mirage 5, which led to the development of Israel's Kfir, which in turn was similar to South Africa's Denel Cheetah.

Mirage III 5PA3



Service and combat

With production numbers adding up to more than 1 400, Mirage IIIs saw service with more than a dozen countries. If the Mirage III and its related variants, such as the '5' and the Nesher, are to be counted as one aircraft type, then it could be said that more aircraft have been shot down by Mirage IIIs than any other fighter jet, except for World War II's Messerschmitt Me 262 and the Korean War's North American Sabre. In terms of air combat statistics, it could be argued that the Mirage III has been the deadliest fighter type of the past six and a half decades.

Mirage IIIs were mostly used in combat by the Israeli Air Force. From the late 1960s to the mid-1970s, hundreds of enemy aircraft were destroyed by IAF Mirage IIIs. Modern day ace Giora Epstein claimed at least 17 'kills' over the course of his career. Most of these were achieved whilst Epstein was flying Mirage III variants.

The South African Air Force (SAAF) received its first Mirage IIIs in the early 1960s and deliveries continued into the 1970s. Variants exported to South Africa were given a 'Z' suffix. Therefore, as an example, Mirage IIICs delivered to the SAAF were known as Mirage IIICZs. Other variants delivered to the SAAF included the BZ, EZ, RZ, D2Z and R2Z. SAAF Mirages saw much combat in the Border War, which lasted from the 1960s through the '70s and '80s. When SAAF Mirage IIIs became older and somewhat obsolescent, they were converted into, or replaced with Atlas Cheetahs, which were developed in South Africa with the help of Israel. Some of these Cheetahs have more recently been exported to South America for use as

spare parts, whilst twelve examples continue to fly with American company Draken International, which provides fighter aircraft for adversarial training.

Several years after SAAF Mirage IIIs had been removed from service, South African airshow enthusiasts were still able to see two examples in action. These included the Mirage IIICZ 800 'Black Widow', as well as a Mirage IIIBZ 817. The latter was painted in the colours of South Africa's national flag. At the time, they were the only flying examples of their respective variants in the world. Sadly, about eight years ago, they were grounded due to a lack of funds to replace their ejection seat parachutes.

Specifications	Mirage IIIC	Mirage IIIE
Length:	13.8 m	15 m
Wingspan:	8.2 m	8.2 m
Height:	4.3 m	4.3 m
Powerplant:	Snecma Atar 09B	Snecma Atar 09C
Thrust:	9 370 lbs	9 436 lbs
Speed:	Mach 2.1	Mach 2.2
Service ceiling:	55 000 feet	55 000 feet
Max. weight:	11 800 kg	13 500 kg

Both variants were equipped with two 30 mm cannons, four underwing weapons pylons, as well as one pylon under the fuselage. ✈

Atlas Cheetah



Mirage IIICZ 800 'Black Widow'



ABOUT WOUTER BOTES

Wouter Botes was born on 23 June 1965 and he holds a Commercial Pilot's Licence with multi-engine and turbine rating, test pilot class 2 and 42 aircraft ratings. In addition, he has three years of aircraft maintenance experience. Wouter has undertaken low-level survey flights in Australia as well as parachuting flights for the Pretoria Skydiving Club.

He is presently a pilot for Emergency Medical flights, maintenance and recovery flights, African continent charters for passengers and cargo. Presently Wouter has a total of 1500 hours including 950 hours as pilot in command. His interest in this series 'Flights to Nowhere' stems from his experience as a radio and TV presenter as well as journalistic crime investigations. Wouter is presently the company pilot for Mike Bolhuis of Specialised Security Services. 📧



THE 727 THAT VANISHED BY WOUTER BOTES



THE 727 WAS STOLEN

A Boeing 727 is not easy to hide. The mere size of the plane, or for that matter, any airliner, would most certainly stand out in a place where there aren't many large planes around.

One way would most certainly be to change the plane's colour and paint scheme or place it in a hangar big enough to fit. Still, it would be an enormous task.

The 727 is stolen

On 25 May 2003, a Boeing 727-223, registered N844AA, was stolen at Quatro de Fevereiro Airport, Luanda, Angola. The aircraft involved was manufactured in 1975 and operated for 25 years by American Airlines. Its previous owner was reported to be a Miami-based company Aerospace Sales and Leasing. It was on lease to TAAG Angola Airlines when it disappeared, but had been grounded and had sat idle at Luanda for 14 months. It was also in the process of being converted for use by IRS Airlines. The aircraft was an unpainted silver in colour with a stripe of blue, white and red. The passenger seats had been removed, because it had been outfitted to carry diesel fuel.

On 25 May 2003, at around 17h00 local time, two men boarded the aircraft. One of them was an American pilot and flight engineer Ben



Ben C. Padilla and John M. Mutantu who stole the American Airlines Boeing 727



C. Padilla. The other, John M. Mutantu, was a hired mechanic from the Democratic Republic of Congo. Neither was licensed or certified to fly a Boeing 727. A 727 requires three aircrew for operational flight. Both men had apparently worked with Angolan mechanics to get the aircraft flight ready in the previous weeks and US authorities speculated that Padilla was at the controls. Conflicting reports and observations by airport workers could not agree whether there were one or two people who boarded the plane. One person would unlikely be able to fly the plane, especially if they were not certified or licensed on the 727.

The Boeing 727 in question

The aircraft began taxiing without once communicating with the control tower. After taxiing aimlessly, it entered the runway. The tower tried to make contact, but there was not any response. Without any lights

the aircraft took off, heading southwest over the Atlantic Ocean and disappeared. The aircraft was filled with 53,000 litres (14,000 US gal) of fuel, giving it a range of about 2,400 kilometers (1,300 nm).

Quatro de Fevereiro Airport in Luanda, Angola

The theories start

The South Florida Sun-Sentinel Newspaper interviewed Padilla's sister, Benita Padilla-Kirkland in 2004 about her brother's possible whereabouts. At this stage the American Government was involved in the search including the US Department of State and amongst other, the FBI. Benita believed that her brother either crashed the plane somewhere in Africa or was being held hostage by some militant group or organisation. The American authorities believed that Aerospace Sales and Leasing President, Maury Joseph was somehow involved in a scam of sorts, as he had a shady past in this regard.

The Jungles of Africa with mysterious secrets

The case became very complicated and even included reports of sightings of the plane in Conakry, Guinea. However, this notion was dismissed by US authorities. The search went on and it later emerged that the US authorities conducted an extensive search through its various agents stationed all over Africa and even as far as Sri Lanka, but no plane was

found. In 2010, Air and Space Magazine published an article on the disappearance and also interviews that were conducted with people involved but couldn't come to any viable conclusion.

Where is Boeing 727 N844AA?

A few scenarios can be considered. Was the plane stolen and delivered to a buyer? If this is the case, then the aircraft would have to be changed in terms of appearance and various other characteristics. It would simply be too difficult to hide in its stolen form. Did it crash, which would again be a viable explanation as not one of the two accused were certified to fly the 727? Possible crash sites are pure speculation, but they could be in the jungles of Africa, especially in the region of the equator, or the Atlantic Ocean. The likelihood of debris from a crash into the ocean, appearing on a nearby beach, is a very real possibility, but to date this has not happened.

To this day, nothing conclusive has been found. No plane, no crash site and no clue. Neither Padilla nor Mutantu have ever been seen or heard from again. It is as if the large airliner vanished into thin air. The wreck, if lying in some dense forest, will only be found by chance. A chance so remote, that it is almost impossible. The missing 727 is still a case to be solved. Maybe the vast Atlantic Ocean has one more secret to keep... ✈



Boeing 727 cockpit



Boeing 727 tanker

Is the plane lying in the forests of the Congo or the Atlantic Ocean?



The Flying Greek

By Divan Muller

Throughout his life, Spiros 'Steve' Pisanos showed considerable resourcefulness and courage. His story can be a tremendous source of inspiration for those hoping to overcome obstacles in their pursuit of a career in aviation.

Early life

Spiros Nicholas Pisanos was born in Athens, Greece, on 10 November 1919. He became fascinated with aviation at a young age, but was told to forget about becoming a pilot, as flying was only for the wealthy. Nevertheless, Pisanos kept looking for ways to pursue his dream. After someone had told him how easily accessible flying lessons were in the United States, he tried to reach the land of opportunity as a stowaway onboard an ocean liner. He was caught before the ship set sail and removed from the vessel. Later, in early 1938, he found employment as a firefighter onboard a Greek cargo ship. During one of the ship's voyages, cargo had to be delivered in Baltimore, a major city and seaport on the east coast of the USA. Upon the ship's arrival at the harbour, Pisanos jumped ship and made his way to the train station in Baltimore. Despite having very little money and being unable to speak any English, he purchased a train ticket and travelled to New York. There, he just happened to overhear two men speaking Greek to each other. He quickly befriended them and explained his situation. The men then provided employment and accommodation. A few months later, Pisanos had learned to speak reasonable English and had begun flight training. He completed his first solo flight in a Piper Cub early the next year. By then, he had become a legal immigrant.

Training and combat

By early 1941, Pisanos had 170 hours of flying experience. World War II had begun, but the USA was yet to participate in it. Pisanos was eager to become a combat pilot and contribute to the Allies' war effort, as he was aware that his home country of Greece had been overrun by Axis forces. Pisanos volunteered to serve with the Royal Air Force (RAF) and his application was immediately accepted. With the help of the Clayton Knight Committee, an



organisation which sought to assist American volunteers in joining the RAF and Royal Canadian Air Force, Pisanos received initial operational flight training in California. He was then transferred to an operational training unit in Cosford, England. Pisanos briefly flew a North American Mustang II, an early P-51 variant which was powered by an Allison engine. He was then assigned to 71 Squadron, the first of three American 'Eagle' squadrons in the RAF, with

which he flew Supermarine Spitfire Mk.Vs in ground attack missions. At the time, Pisanos was given the name 'Steve' by his American friends, as it was easier to pronounce. He was also known as 'the flying Greek'.

On 7 December 1941, Japanese forces attacked Pearl Harbour, which led to the United States officially entering World War II. Soon, the RAF Eagle Squadrons would be absorbed into the US Army Air Forces (USAAF). This meant that Pisanos would no longer be



allowed to serve with his unit, as he was not an American citizen. Eager to keep Pisanos in his unit, Squadron Leader Chesley Peterson worked with the US government to grant Pisanos citizenship. In the process, he became the first person to be naturalised as an American citizen whilst on foreign soil. The event was covered by well-known broadcast journalists such as Walter Cronkite and Edward R. Murrow. Later that year, 71 Squadron was absorbed into the USAAF's 4th Fighter Group as 334th Fighter Squadron. In early 1943, the unit was equipped with Republic P-47 Thunderbolts. Soon, Pisanos claimed his first aerial victory by shooting down a German Focke-Wulf Fw 190 fighter over Belgium. By January 1944, he had shot down six enemy aircraft, consisting of Fw 190s and Messerschmitt Bf 109s, earning him 'ace' status. Pisanos achieved his 'kills' whilst escorting bombers over Europe. Pisanos' squadron was then re-equipped with P-51B Mustangs. Three months later, he shot down four more Bf 109s, bringing his total aerial victories up to ten. This effectively made him a 'double ace'.

On 5 May 1944, during the same bomber escort mission in which he claimed his tenth and final 'kill,' Pisanos' Mustang developed engine trouble and he crash landed in France. Despite being injured, he was able to escape and evade capture by German soldiers. For the next four months, he worked with the French Resistance and the American Office of Strategic Services to monitor German forces' movements in and around Paris. In September, after Paris had been liberated by the Allies, Pisanos was transferred back to the USA.

After the War

Upon his return to the USA, Pisanos was assigned to a flight test unit, where he primarily flew captured enemy aircraft. However, the Lockheed P-80 Shooting Star was arguably the most notable aircraft test-flight flown by Pisanos. It later became the first jet-powered fighter used operationally by the US military. Pisanos briefly flew Douglas DC-3s and Lockheed Constellations for Trans World Airlines whilst studying military science, before returning to the newly formed US Air Force (USAF) to fly supersonic fighters, such as Convair's F-102 and F-106 interceptors.

During the 1960s and '70s, Pisanos completed a tour of duty in Vietnam. He then served with the North American Aerospace Defence Command (NORAD) and helped introduce the McDonnell Douglas F-4 Phantom II to the Hellenic Air Force. He retired from the USAF in 1974. In 2008, he was inducted into the International Air and Space Hall of Fame at the San Diego Air and Space Museum in California.

Over the course of his life, Pisanos had been awarded dozens of medals, including a Distinguished Flying Cross with four Oak Leaf Clusters and France's Legion of Honour. Known as an incredible pilot, as well as for his humility and never-ending gratitude for the opportunities presented to him throughout his life, the 'double ace' died from heart failure on 6 June 2016 at the age of 96.

Steve Pisanos, the 'Flying Greek,' was without a doubt one of the 'best of the best'. ✈

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Safran and Uber exhibit full scale eVTOL mock-up at NBAA-BACE

Last month at NBAA in Las Vegas, Uber and Safran Cabin exhibited an eVTOL mock-up based on a future vision for on-demand urban air mobility vehicles. Designed around the mission of turning a typical 90-minute car ride into an 8-15-minute flight, future eVTOL vehicles will allow passengers to quickly travel point-to-point in crowded urban environments by going vertical.

In a co-creation project with Uber Air, Safran Cabin designed a fully integrated air taxi vehicle mock-up.

The interior will feel familiar to passengers, as Uber seeks to make urban air travel simple, safe and accessible to all. The designers of Safran Cabin focused on providing four passengers a safe and comfortable experience along their very short flight. Passengers will have a common experience in an Uber branded cabin interior, regardless of which OEM built the aircraft.

“
After the overwhelmingly positive feedback at the Uber Elevate Summit in June 2019, we are delighted with the opportunity to present the eVTOL cabin together with Uber to the business aviation community at NBAA,
”

said Norman Jordan, CEO of Safran Cabin. ✈





Samson Sky signs supply agreement with Aviation Safety Resources (ASR)

Aviation Safety Resources, Inc., (ASR) a company that designs, tests and produces emergency recovery systems for the aviation and Urban Air Mobility (UAM) markets and Samson Sky, creators of the Switchblade flying sports car, have announced the completion of a strategic development and supply agreement that will make ASR's parachute recovery system standard equipment on the Switchblade.

"Whole-aircraft vehicle parachute recovery systems will be essential to the growth of personal aerial transportation," said Larry Williams, ASR president and CEO. "ASR is very excited to offer the next generation of vehicle recovery systems specifically designed to meet the safety needs of this market. We are applying new technology, reducing the product cost and schedule risk. Our patent-pending solutions are designed to safely bring down an entire aircraft and its occupants in the event of an in-air emergency."

Under the terms of the long-term cooperative agreement, ASR's engineering and design team will work with Samson Sky to design, produce and test a recovery system that matches the unique dimensions and requirements of the Switchblade. The agreement also includes plans for Samson to purchase some 400 units annually over the next five years. "The Switchblade is a quantum leap in personal transportation, effectively transforming the concept of mobility with

a truly useful flying car," said Samson Sky CEO and Switchblade designer Sam Bousfield. "It is unique in that it retracts the wings and tail in a way that protects them whilst on the ground. This feature and the fact that the Switchblade is a high-performance vehicle in both modes, sets it apart from other entrants in the race to build the first practical flying car. This agreement with ASR will set us apart even further by ensuring that our vehicles are the safest in the market."

Earlier this year, ASR announced the introduction of its Soteria family of parachute recovery solutions for light sport, ultralight and experimental aircraft. Last month, the ASR team won a Shark Tank-style pitch competition at the Revolution Aero innovation summit in San Francisco. The pitch focused on the company's Xtreme Rapid Deployment (XRD) system that slows the descent of an aircraft without relying on altitude loss. ✈





LILIUM

releases new footage of air taxi as it completes early flight testing



Munich-based start-up Lilium is developing an on-demand air mobility service and has released new footage of its all-electric Lilium Jet as it celebrates completing its first phase of flight testing, a milestone it has reached less than six months since starting its flight test campaign. The Lilium Jet, the world's first five-seater, all-electric, vertical take-off and landing jet, was revealed to the world in May 2019 and since then has been put through its paces at an airfield in southern Germany. The emissions-free aircraft, which will be able to complete journeys of up to 162 nautical miles in one hour on a single charge, has now been flown at speeds exceeding 54 knots in increasingly complex manoeuvres.

The new footage reveals, for the first time, the aircraft transitioning from vertical flight to level flight. This signature manoeuvre, first completed just weeks after the aircraft's maiden flight, is one of aerospace's greatest challenges and is what gives the Lilium Jet its significant range advantage, with its two sets of wings contributing to much higher levels of efficiency than in aircraft lifted solely by rotors.

With a range of 162 nautical miles, the Lilium Jet will be capable of completing much longer journeys than the vast majority of its competitors, allowing it to connect entire regions rather than just making short trips across a single city. The release of the footage came as the company also celebrated the completion of its first dedicated manufacturing facility, an important step towards preparing the company for serial production of the Lilium Jet. The company's first manufacturing facility will soon be complemented by a second, much larger, facility which is already under construction at the same site. Combined, they will support Lilium's aim of producing hundreds of aircraft a year by the time commercial services begin in 2025.

Lilium also announced an addition to its Senior Management Team, with Airbus veteran Yves Yemsi joining the team as Chief Programme Officer, having worked as Head of Programme Quality for the highly

successful Airbus A350 aircraft. On 4 May this year, the Lilium Jet prototype first took to the skies powered by 36 all-electric jet engines, the aircraft has zero operating emissions and requires less than 10% of its maximum 2000 horsepower during horizontal cruise flight thanks to the lift generated by having two sets of wings.

Since its maiden flight, which featured a simple vertical take-off and landing, the aircraft has been undertaking increasingly complex manoeuvres and longer flights. Having successfully completed more than 100 different ground and flight tests, the first phase of testing culminated with a flight that saw the aircraft travel at speeds exceeding 54 knots.

During the first phase of testing, the aircraft also successfully completed a range of safety tests, including engine failures and flap failures, as well as fuse-blow-tests on the ground and in the air.

The aircraft, which is controlled remotely from the ground, will now move on to its second phase of testing which will look specifically at how it performs at high speeds. With a top speed of 162 knots, the Lilium Jet is expected to shortly become the fastest all-electric vertical take-off and landing (eVTOL) aircraft in the world. ✈️



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LEONARDO helicopters with new South African distribution agreement



Absolute Aviation Group has signed a contract for an AW119Kx and an AW109 Trekker which builds on the established success of the AW109 series for a range of roles in the country. A Leonardo AW119Kx started its demonstration tour of South Africa during the first week of October to show its unique capabilities. An additional order by a private operator for a VIP AW139 grows the Leonardo helicopter fleet in South Africa with more than 60 units of various models in service today.

Early in October Leonardo announced the signing of a distributorship agreement with Absolute Aviation Group in South Africa for the civil and commercial market. The agreement, which has the potential to be extended to other Southern African nations in the future, includes the AW119Kx single engine, the AW109 GrandNew and AW109 Trekker light twins, the AW169 light intermediate and the AW139 intermediate twin types.

Absolute Aviation Group has also signed a contract for an AW119Kx and an AW109 Trekker, with a commitment to purchase further units from the various models in the next couple of years. Deliveries of the two aircraft are expected in 2020. The order marks the entrance of the AW109 Trekker, the newest light twin model in the Leonardo product range into the South African market and builds on the significant success of other AW109 series variants in the country in past years for a variety of roles. This latest AW119Kx order also



grows the presence of the most capable light single engine helicopter in the country, where a demonstration tour has begun to show its unique capabilities in terms of performance, advanced avionics, reliability, safety and versatility. Leonardo helicopters' success in South Africa is further strengthened by the recent contract for an AW139 helicopter in VIP configuration by a private operator. More than 60 helicopters of various models fly in the country today for both civil and government roles including VIP/corporate transport, emergency medical service, Oil & Gas, harbour pilot shuttle, utility and naval tasks.

The Absolute Aviation Group is a full spectrum aviation group, offering to customers unparalleled levels of support and expertise in the form of bespoke aviation services. Absolute Aviation is one of the only general aviation businesses able to offer full turnkey aviation service to aviators on the African Continent. Group's entities are collectively aimed at providing a differentiated, customer centric, turnkey solution to aircraft ownership and operations. In addition to the Group Head Office, Absolute Aviation Group owns and operates a number of aviation businesses out of five hangars at Lanseria International Airport, Cape Town International Airport, Wonderboom Airport, Maun and Gaborone in Botswana. 🇿🇦



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Sikorsky introduces RAIDER X

Absolute Aviation Group has signed a contract for an AW119Kx and an AW109 Trekker which builds on the established success of the AW109 series for a range of roles in the country. A Leonardo AW119Kx started its demonstration tour of South Africa during the first week of October to show its unique capabilities. An additional order by a private operator for a VIP AW139 grows the Leonardo helicopter fleet in South Africa with more than 60 units of various models in service today.

Early in October Leonardo announced the signing of a distributorship agreement with Absolute Aviation Group in South Africa for the civil and commercial market. The agreement, which has the potential to be extended to other Southern African nations in the future, includes the AW119Kx single engine, the AW109 GrandNew and AW109 Trekker light twins, the AW169 light intermediate and the AW139 intermediate twin types.

Absolute Aviation Group has also signed a contract for an AW119Kx and an AW109 Trekker, with a commitment to purchase further units from the various models in the next couple of years. Deliveries of the two aircraft are expected in 2020. The order marks the entrance of the AW109 Trekker, the newest light twin model in the Leonardo product range into the South African market and builds on the significant success of other AW109 series variants in the country in past years for a variety of roles. This latest AW119Kx order also grows the presence of the most capable light single engine helicopter in the country, where a demonstration tour has begun to show its unique capabilities in terms of performance, advanced avionics, reliability, safety and versatility. Leonardo helicopters' success in South Africa is further strengthened by the recent contract for an AW139 helicopter in VIP configuration by a private operator. More than 60 helicopters of various models fly in the country today for both civil and government roles including VIP/corporate transport, emergency medical service, Oil & Gas, harbour pilot shuttle, utility and naval tasks.

The Absolute Aviation Group is a full spectrum aviation group, offering to customers unparalleled levels of support and expertise in the form of bespoke aviation services. Absolute Aviation is one of the only general aviation businesses able to offer full turnkey aviation service to aviators on the African Continent. Group's entities are collectively aimed at providing a differentiated, customer centric,

turnkey solution to aircraft ownership and operations. In addition to the Group Head Office, Absolute Aviation Group owns and operates a number of aviation businesses out of five hangars at Lanseria International Airport, Cape Town International Airport, Wonderboom Airport, Maun and Gaborone in Botswana. ✈

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PANTHERA

Lanseria International Airport opens its new multi-storey parkade

By Athol Franz

On Friday 25 October, I attended the exciting opening of the new multi-storey parking facility at Lanseria International Airport. In addition to an excellent address by airport CEO Rampa Rammopo, the building was ceremonially opened by the Gauteng Honourable MEC for Public Transport and Road Infrastructure, Jacob Mamabolo and the Chairman of the Lanseria Board Patrick Dlamini. Numerous other dignitaries, tenants, operators and customers of the airport were present.

Mr Rammopo had the following to say in his address: "Today's commissioning is part of a greater five-year expansion plan that has seen the construction and completion of a new runway; a control tower and fire complex; and now this very building. Each of them brings us that much closer to realising our greater vision of becoming a world-class airport that provides a gateway to Africa. They also speak to our vision of growth and possibility over the past four and a half decades.

From our humble beginnings 47 years ago as a grass strip airfield to welcoming former President Nelson Mandela to Johannesburg after his release from prison in the 90s, all the way through to greeting our very first international customers after they landed and finally standing here with you today, the story of Lanseria International Airport continues to remind us of what is possible if we believe and then work together.

This multi-storey parking (MSP) facility was inspired in much the same way as each of our other signature projects: by listening to and engaging with our customers, stakeholders and partners and then asking the question: 'what if?' In the case of our MSP, the answer was about far more than just parking. In clarifying our vision for our role in South Africa and Africa, we created a long-term plan to consciously and consistently move towards this goal.

We broke ground on this project in November 2017 and completed it in June this year. It has added 1 000 more parking bays to the airport, as well as creating a retail node that houses restaurants, car rental services and banking offerings, amongst others. However, this privately funded project brought together some of South Africa's top construction and infrastructure development companies; boosting local jobs and stimulating the local economy. Over 200 temporary jobs were created during construction, with 93 permanent jobs now a direct outcome of the development. A further 67 jobs are anticipated to be created when the remaining retailers open their doors. This speaks of our critical role in this area, community and region.

We are committed to doing our part to ensure this part of the city is developed and that our community members benefit from this



Nooitgedacht Primary School choir



L to R: Mr P Dlamini (Chairman of the Board Lanseria), Mrs ME Moblopi (Chief Financial Officer Lanseria), Mr J Mamabolo (MEC Transport and Road Infrastructure) and Mr Rampa Pammopo (CEO of Lanseria).

development. Whilst we are delivering on this promise, in part through infrastructure projects, our Customer Service Information (CSI) focus is predominantly about creating access to education and healthcare for children and individuals from the surrounding areas. We believe that our future pilots, air hosts and hostesses, ground staff and engineers can be and must be found here. Only in this way will we reimagine a future of opportunity for all.

The Lanseria you see today will look totally different in the next five to ten years. We are currently in the process of upgrading our pier, increasing capacity from 3.0 million to 4.5 million passengers.

This project will be completed by the end of March 2020. This project also includes an extra baggage carousel that will assist in offloading luggage faster as additional routes open and we service more passengers. This space is also adding to temporary and permanent jobs.

In the next few years, we will construct a boutique hotel on the premises; increase the capacity of our fuel farm and build an office complex and a cargo facility. We are also planning a Maintenance Repair Operations (MRO) facility which will see us offer technical services to airlines, encouraging them to establish a home base on our premises. Our ongoing talks with the Gautrain will hopefully ensure that a line to Lanseria will be developed in the not too distant future.

Each of these projects speaks to the vast potential of the future we see for our community, country and continent. They talk to our plans to realise our greater vision for success in partnership with you - our valued stakeholders. They act as an invitation for us to continue to grow Lanseria, our community and our region as a beacon of hope and inspiration: showing the world what remains possible if you believe. I thank everyone who has been part of the process of the vision, creation and construction of this new parkade."

On behalf of African Pilot, I would like to thank the excellent communication and business relationships African Pilot has shared with Mr Rammopo and the airport in general. I am looking forward to being part of future developments at this most important privately-owned international airport in Gauteng. 📍

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FRANCE AND GERMANY REACH EXPORT AGREEMENT OF FUTURE FIGHTER JET



In a military cooperation agreement, the two governments of France and Germany have seemingly heard the call of manufacturers that had urged them to settle their differences during the Franco-German ministerial council meeting in Toulouse, France on 16 October 2019. The new agreement will set up a reciprocity system where one country will automatically approve the sale of weapons if their share in the selling price is less than a certain percentage (rumours say about 20%). "The arms export agreement seals mutual trust between France and Germany and is the condition for the success of joint projects such as the tank and the plane of the future," the two governments outlined in their official declaration.

As for the contract on technology demonstrators that Dassault and Airbus expected this year, they will have to wait until January 2020. It is valued at €150 million over two years, with the objective to see a Next Generation Fighter demonstrator take to the skies by 2026. Despite the delay, Dassault CEO Eric Trappier said this new step was welcomed. "We look forward to January to begin the demonstrators' work," Trappier commented.

This year, the Paris Air Show witnessed the signing of the agreement that set the legal framework for the joint development of the Future Air Combat System (FCAS) European fighter jet programme started by France and Germany and recently joined by Spain. Since then, Dassault and Airbus have been eagerly waiting for the green light to start developing their demonstrators. However, this agreement on the executive level could once more face problems when presented to the legislative power. Members of the Bundestag, the German parliament, could be sceptical regarding the industrial

division of the FCAS programme and block the agreement, as they have done previously when presented with the industrial structure of the engine subprogramme.

The SCAF cooperation is intertwined with two other projects: the main ground combat programme (MGCS) for a European battle tank and the Eurodrone (development of a European Medium Altitude Long Endurance drone). Whilst in Toulouse, French President Emmanuel Macron and German Chancellor Angela Merkel also visited the assembly line of the Airbus A350 XWB. "This A350 is the embodiment of European solidarity in a time of international trade crisis," declared the French president. "Fifty years ago, decisions led to the development of close cooperation between our two countries and we will do everything to ensure the success of this venture," the German Chancellor added. ✈



British F-35Bs



land on the HMS Queen Elizabeth

For the very first time, F-35B Lightning II fighter jets of the Royal Air Force and the Royal Navy have landed on the HMS Queen Elizabeth aircraft carrier whilst off the coast of the United States. The seven F-35B Lightning fighter jets are undergoing operational trials with the aircraft carrier. They belong to the Number 617 Squadron, a joint squadron composed of personnel from both the Royal Air Force and Royal Navy, which is the first of the British military to be equipped with the Short Take Off Vertical Landing (STOVL) variant of the Lockheed Martin aircraft.

The testing campaign, called WESTLANT 19, evaluates the capacity to operate as a Carrier Task Group (or Carrier Strike Group) through the development of combat techniques for exploiting the fighter's capabilities, as well as strengthen its interoperability with the US Marine Corps.

"This is another step towards the UK's carrier strike capability becoming fully operational," said Defence Secretary Ben Wallace in a press release, adding that "the bringing together of the UK Lightnings on the first in its class HMS Queen Elizabeth paves the way for the world's most up to date, fully integrated carrier force". The campaign that should last eleven weeks, will see more than 500 launches and landings. It will allow for determining the rules for the safe operation of the aircraft onboard the carrier. Despite its VTOL capability, the F-35B from the carrier group will use the shipborne rolling vertical landing (SRVL) method. This technique, by taking advantage of both the vertical thrust and the lift from the wings, allows for landing in a short distance, with a heavier payload than a pure vertical landing. "These trials are aimed at 'end-to-end' testing of the aircraft and personnel to ensure the aircraft are compatible with the carrier", explained the British Ministry of Defence. Interoperability is critical for the British aircraft carrier. The number of Royal Air Force and Royal Navy F-35B fighters is not yet enough to constitute a full Carrier Strike Group. The ship was built to operate 24 aircraft on average and can transport a maximum of 35 fighter jets. Therefore, for its first operational deployment scheduled for 2021, the HMS Queen Elizabeth should have a mixed US-British air group. Commissioned in December 2017, the HMS Queen Elizabeth is the largest warship ever built in Europe. It should be delivered in 2020 to the Royal Navy. Its sister-ship, the HMS Prince of Wales, should be commissioned in December 2019. 🛩️



Russian Tu-160 bombers arrive in South Africa

By Charlie Hugo

Two Russian Aerospace Forces' Tupolev Tu-160 'Blackjack' bombers touched down at Air Force Base (AFB) Waterkloof on Wednesday 23 October, in a ground-breaking visit to South Africa. The aircraft arrived at approximately 16h30, later than expected due to a delayed take-off from Russia due to bad weather.

The aircraft were originally scheduled to arrive in South Africa on 22 October, but were delayed by more than a day due to technical issues. They departed Engels, refuelled over the Caspian Sea and then headed 11 000 kilometres non-stop to South Africa. Engels, formerly known as Pokrovsk and Kosakenstadt, is a city in Saratov Oblast, Russia. It is a port and air-base located on the Volga River. When they entered South African airspace, the Tu-160s (registrations RF-94112 and RF-94102) were escorted by three South African Air Force (SAAF) BAE Systems' Hawk Mk 120 Lead In Fighter-Trainers, which returned home to





their base at AFB Makhado in Louis Trichardt, in the north of the country near the Zimbabwe border. Supporting the Tu-160 bombers and accompanying the Russian delegation was an Antonov An-124 (registration RF-82034) cargo aircraft and an Ilyushin Il-62 (registration RA-86498) passenger jet, which arrived on the 22nd. Members of the Russian delegation met with their South African counterparts at the St. Georges Hotel and Conference Centre in Centurion near Pretoria on Wednesday morning to discuss search and rescue, amongst other topics.

The SAAF's deputy chief, Major General Innocent Buthelezi, said on Wednesday it was a privilege to host the Russian aircraft especially as it was the first time such aircraft have landed in Africa. He said the visit was part of a military-to-military cooperation between Russia and South Africa and he looked forward to strengthening relations between the two defence forces. Buthelezi explained that the visit emanated from a memorandum of understanding signed some time ago. In 1995 Russia and South Africa signed agreements on military technical co-operation and co-operation between their respective defence ministries. More recently, in August 2018, Russia signed a military technical co-operation agreement with the Southern African Development Community (SADC) on the side-lines of the BRICS summit in South Africa.

Buthelezi said the unarmed Tu-160s flew to South Africa to show their operational capabilities, but it was also a chance for the South African Air Force to showcase its own capabilities. Lieutenant General Sergei Kobylash, commander of Russia's Long-Range Aviation, thanked the SAAF for its warm welcome after the 13-hour flight. He said the primary mission of the Tu-160 flight was to train crews on long-range missions and improve co-operation with the SAAF. Siphwe Dlamini, Department of Defence head of communications, said the Russian visit had been planned long ago and was part of the bilateral defence ties between South Africa and the Russian Federation. He added that South Africa has had exercises with the Russian Navy in the past and has competed in Russia's Army Games, whilst South Africa has military personnel training in Russia. In late November of this year, Russia, China and South Africa will take part in a joint naval exercise off the South African coast. Dlamini said the Russian Air Force visit had been in the making for the last five to eight years.

Defence expert and Director at African Defence Review, Darren Olivier, noted that the visit was originally scheduled for 2016 which was to coincide with that year's Africa Aerospace & Defence

exhibition at AFB Waterkloof. At the last minute it was postponed, seemingly as a result of Russia being unable to spare Tu-160 aircraft during a key period of its operations in Syria.

The itinerary of the Russian contingent was not divulged, but the Russian aircraft flew to OR Tambo International Airport on Saturday 26 October and departed for their base at Engels very early the following morning. The Russian Ministry of Defence said the purpose of the visit 'was the development of bilateral military cooperation and the development of cooperation between the Russian Aerospace Forces and the Air Force of the Republic of South Africa.' It added that the event will help to increase the combat training of the flight personnel of the two countries. 'Comprehensive friendly relations between Russia and South Africa are built in the spirit of strategic partnership and mutual understanding.'

The visit coincided with the opening of the first ever Russia-Africa summit in the Black Sea resort city of Sochi, which was attended by President Cyril Ramaphosa, who was accompanied by the Ministers of International Relations and Co-operation, Dr Naledi Pandor, State Security, Ayanda Dlodlo and Communications and Digital Technologies, Stella Ndabeni-Abrahams.

Russia is heavily promoting its military hardware at the summit, from helicopters to assault rifles and facial recognition systems. Rosoboron's export director Alexander Mikheev told AFP that Russia would like to expand its presence in Africa, since African countries now account for 40% of the exporter's current orders. Mikheev said 20 African countries are working with Russia and African arms contracts are worth \$12 billion. Nine countries, including Rwanda, Mozambique and Angola, are set to receive Russian arms this year. Sales include attack helicopters, fighter jets and surface-to-air missiles. JSC Rosoboronexport, based in Moscow is the sole state intermediary agency for Russia's exports / imports of defence-related and dual use products, technologies and services. ✈



Deputy chief of the SAAF and Deputy Chief of the Russian Air force and Mr Dlamini of the Defence Council

Convair 340/440 Wonderboom 10 July 2018

part three of three CAA 9722

Extracts from the accident report (SACAA) - shortened

1.18.2 Flight Familiarisation. Crew Resource Management (CRM) training alone is inadequate if the crew does not conduct a familiarisation flight to practise what they have learnt in CRM. The results of not practising the skills learnt at CRM can lead to a decrease in communication, an increase in emotional conflict, an increase in wrong decision making and a lower probability of correcting a deviation from checklists or the desired flight path. The more CRM training, the less likely that the crew co-ordination will break down under a stressful situation, i.e. during an emergency. It would, therefore, be advisable for a crew to practise as a team to determine each other's duties in the flight deck during a normal flight or an emergency. This practise can be done in a form of a test flight or a familiarisation flight.

2.5.4 Evidence obtained from the GoPro video camera installed in the cockpit showed the Licensed Aircraft Maintenance Engineer (LAME) giving the PM the quick reference handbook (QRH). However, the PM elected to ignore and not use the QRH for procedures to be followed during an emergency in-flight engine fire as was the case during this accident flight. This, therefore, explains why the left engine continued to be on fire until the aircraft impacted the ground.

3.2.4 Both pilots last flew the Convair 340/440 aircraft 17 months prior to the accident flight, therefore, none of the crew complied with the 12-month competency check.

3.2.10 The LAME misdiagnosed the manifold pressure defect by always removing the manifold pressure gauge whenever there was a left-engine manifold pressure defect, which was reported twice prior to the accident flight.

3.2.16 After the 50 knots call, the PM indicated that the left manifold pressure indication appeared to be low, but the crew did not abort the take-off as the aircraft had not yet reached V1 speed.

3.2.17 The assistant engineer who was seated in the left-hand side of the cabin informed the crew of the left-engine fire. The master caution light illuminated. however, the crew never activated or discharged the engine fire extinguishing system or followed the quick reference handbook.

Comments by Charlie Marais

The last contribution regarding this accident will be spent on Crew Resource Management (CRM) issues and Human Factors (HF). Immediately the purists would start arguing that HF is part of CRM. Although human factors are covered under the broad umbrella of CRM, human factors are more specific to error and transgression behaviour, as well as, I would argue in this case, the habitual residue of repeated conscious actions becoming subliminal by nature. This statement as a premise of argument, would clarify the differences in the concept of CRM and that of sub-conscious behaviour. Okay, I get it; I should be more specific and speak flight deck language. I am not sure at what weight level, or passenger level the cockpit becomes a flight deck, but in this case, I would like to refer to the space occupied by the crew as the flight deck. This may not be of immediate concern to this specific flight, but to notice the number of hours the pilots had; there were more than 38 000 hours of flight experience between the two pilots. This observation would be the origin of quite a few of the arguments to follow.

Part 3 – Crew Resource Management and Human Factors

As the individual words in the title of CRM relates, the concept is related to a crew, or in other words a team, as well as the capability required to manage all resources, including the crew members and whatever else may be deemed a resource. The resultant synergy generated by crew interaction, is seen as a major contributor to navigating through adverse or difficult situations. Teamwork is thus regarded as one of the main reasons to create an environment where interactions between the crew, the aircraft and the environment, faced at a specific time in a specific space, guided by procedures, are managed to enhance a safe, or safer outcome.



Martin's Air Charter Convair

Convair engines running when the aircraft was owned by Rovos Air



On the other hand, intertwined into this concept, is the personality makeup of each of the crew members. Their specific human nature as developed and imprinted in their sub-conscious, becomes part of the mix and would have a profound influence on individual behaviour during adverse conditions. These imprints, now part of the 'mind of the cockpit', must be managed. In the case of the Convair accident, the flight deck was void of synergy. For this to be attributed to a poor CRM situation is a bit of a stretch as the individuals all had to have a baseline of flight deck functioning capability as a baseline.

To follow procedure is not commonly known as CRM, but rather the discipline that is embedded in all aviators to follow protocol. The responses are normally carried out without thinking and demand no innovative thinking in the broader sense. Drawing from automated or sub-conscious behaviour is the one human factor that works. Just in following the Standard Operating Procedures (SOPs) during the take-off roll, after take-off when the engine fire was confirmed and lastly during the ensuing minutes of sheer terror as the captain tried to control the aircraft, would have had a very different result. No matter how hard he tried and how much the Pilot Monitoring (PM) helped him, the natural forces of science and mechanics would prove to be too strong a match. There is no CRM in doing basic procedures. There is no synergy required and to note the lack of crew functioning as a lack of CRM is a bit outside the scope of team work. Just do your job and know when to do it and then do it as you were taught. In my opinion, the lack of performance from the crew should therefore have had a different reason, which will be discussed as this argument flows.

This is where the accumulated hours in airliners come to mind. The airliners these pilots have flown in the past few years were most probably jet-engine multi engine state of the art, in comparison to the Convair. For many hours and during many simulator sessions, the specific pilots never had to feather a

propeller during engine failure or fire. The procedures after an engine failure are quite different and point one was probably to get the aircraft under control. Time is not that critical when it comes to actions after an engine failure, especially during the latter part or just after take-off, when comparing propellers and jet engines. Loss of control in this environment has everything to do with the removal of drag when it comes to propeller aircraft. Therefore auto-feather is standard in more modern aircraft, with only the imbedded belief that it will work. In this case, the auto-feather light was not illuminated when tested. When the LAME responded that the light bulb was inoperative, there was no further attention to this statement and it was assumed that the system was still functional. If though it does not work automatically, the pilot must then act. Not acting is not an option and this crew did not act as expected.

Then there was the fire. This fire was not hidden and unknown to the crew. Later during this stage of the take-off, the left engine fire caution light illuminated, with the associated audio warning that must have grabbed everybody's attention. The third member on the flight deck, although not qualified as per legislation, knew very well what was happening and he handed the PM the quick referencing handbook (QRH). The PM ignored this and elected to continue without consulting the QRH.

So far, the situation discussed concerned bold actions which the crew had to make. No CRM yet, but then the only use of resources was the Pilot Flying (PF) asking the PM to assist in controlling the aircraft by putting more pressure on the right rudder to oppose the yaw of the aircraft to the left, which was the result of the immense drag experienced with the propeller not feathered on the left burning and underperforming engine. It appears that no SOPs were followed and to boot, no collective energy was used to solve the problem. No CRM and as such no synergy at any level seems to have been the situation as verified by an onboard GoPro which was analysed after the accident.

Here follows a list of mistakes made by the humans involved: No valid pilot licences to fly this specific sortie; No flight planning as indicated by the ignorance of a valid NOTAM; Mis diagnosing the reason for the MAP drop on the left engine; Indication that blow-by tests were performed, when the investigation found this not to be true; Pilot recency lapsed; The decision to take passengers on an acceptance flight; Possibly ignoring or nonattendance to the runup MAP between the gauges; No reaction to the possible cause when the aircraft veered to the left during take-off; No reaction to the PM input of the left MAP low during the take-off run; No action to the verbal notice to the LAME of the left engine on fire; No standard procedures followed when the left engine fire warning and audio took centre stage; No following of SOP by the crew at any time; No teamwork to facilitate adverse condition through application of CRM; Main attention on solving the effect, but no attendance to the cause; No attendance to passenger safety from the flight deck; Captain or PF performed no management of the flight deck; Captain did the flying (Aviate), but no Navigate (management of the situation) and very little to no Communicate; Ignoring warning lights and audio; Ignoring the necessity of functional warning lights; Assuming gauge of light failures when it was system substandard functioning; Total reliance on historical experiences and not paying attention to the present anomalies.

Recommendations

The human failures occurred during the following phases: crew and aircraft administrative compliance, aircraft maintenance, checks during the taxi and pre-lift-off phase and the phase of flight. I am not necessarily in agreement with the SACAA report as far as CRM, as described in par 1.18.2 as indicated in the report extractions. To do crew functions is not to do CRM. As a single crew member in my single crew operated aircraft, I do SOPs during all the stages as required and this is not CRM, but straight discipline by applying the 'must do' items. Crew duties and crew efficiency functioning are not the same process as CRM. First the crew must know their own duties as well as their duties on the flight deck. Crew duties are not part of CRM training and never will be as the idea of CRM is generic to all flight decks, but individual crew duties during the flight are stipulated in the operating manual of the aircraft. This checklist of duties will assume that the specific crew member involved knows the drill and understands his or individual required functions. Multi Crew Cooperation now comes into play and this is to drill and ensure crew collective functioning according to a specific flow in flight deck management. The resource management only now comes into play on not just what to do, but also on how to do it, catching the shortfalls and errors of each crew member by each crew member.

I agree that poor flight planning, poor flight crew training or recency and poor individual crew performance leads to the necessity of CRM, but CRM is not the place to discover poor anything. CRM is to catch errors or transgressions and anomalies and then to communicate in such a way that the captain is aware and that the correct solution can be found and applied through synergy. In this case there was no normal functioning of the crew when individual checks and SOPs were concerned. This then naturally led to CRM not being possible, as crew competency, as step one, was not in place.

Most of the errors, in all the phases of flight preparation and flight performance, were SOP or crew dysfunctionality, which left no room for CRM to even be a consideration. Discipline and straight



The factory the Convair hit



Convair rescue team



Convair seating

cold-hearted hard baselines were not present. The crew licensing problems were not CRM related, but discipline related. They either had a laissez-faire attitude or knew about the licence shortcomings and hoped to get away with it. The poor or incomplete ground preparation of the aircraft was again poor disciplined and definitely laissez-faire, as it was either too time consuming or considered to be okay to suit timelines, but with full knowledge on the principles involved, which was not followed, is not okay. The idea to take passengers on the first flight when all was not entirely satisfactory, was a decision made without considering consequences. All responsibilities are accompanied by accountabilities. To continue with non-adherence either due to lack of knowledge or a poor attitude, will inevitably lead to the same outcome. In this accident, it seems that there were transgressions in this regard.

Ignoring warning light dysfunctionality is a sin. Here is the problem; as a pilot I am heavily influenced by the opinion of my technical assistance. If he says it is okay, then it is okay. It may be considered okay for the present, but when we need that warning or auto function and it is not there, the playing field becomes very uneven very rapidly. To defer a snag legally, must be according to the Master Equipment List (MEL) and nothing else. The MEL was not adhered to dare I say. This makes the captain accountable, but as he may have been misled, there is a case to be made against his advisors.

Next, I would highlight the human factors as I interpreted them. The pilot I believe had a lot of experience, but in a different flight deck

setup, with different engines and his dependency on the LAME made this quite clear. He was out of his depth concerning the adverse chain of events. The reasons for this could be due to drilled actions and reactions from a non-propeller type aircraft or probably both. He had more trust in his technician than he probably should have had. The reason for this could be his lack in system understanding through time lapse or improper technical training to start off with.

He was totally at the mercy of the LAME and found comfort in the LAME having done this kind of trip before. Then to add in, he also, due to his unease of this specific flight deck and happenings covered by assurances by the LAME, was so out of his comfort zone as the accident was unfolding, that the only thing he could handle was to try and fly the plane. Some kind of over exposure to stress, which his being could only handle by narrowing on one aspect due to a loss of performance ability, cutting out the rest as a sort of panic or fixation relief. The PF flew gallantly until the accident to save the aircraft and passengers.

The PM was another strange observation. He had more hours and possible experience than the PF, but his contributions were factual, but not assisting in reaction to such indications. Again, the same arguments would follow, but his lack of assertiveness when the situation deteriorated, also indicates discomfort and a possible disbelief in what was unfolding. Procedural compliance was not even considered, and this was the place to apply CRM. Unfortunately, there was no such input as the foundation to perform CRM was not solid.

Then there was the LAME. I discussed his ground performance and now it must be related to his airborne performance. I know that he was not legally a crew member, but he was considered so by the captain and as such performed his perceived functions. Clearly there was no abort briefing by the captain to guide crew members on the actions required on recall when faced with adversity. The mind of the cockpit was not primed to go into auto-mode in case of any anomaly. The lack, or possible lack of flight deck training and actions now became visible as the LAME did everything, but gave no rational input to kill the burning engine. I understand that such a command must come from the captain, but CRM dictates that we must all catch the ball when dropped. Again, no foundation, so no input.

The fate of this flight precipitated during ground carelessness by all crew members, which left them stranded when superior knowledge and skills had to be applied when required. This accident, even with the engine fire, should not have led to the crash and death of the LAME, because the accident was avoidable.

Loss of control, cited as the main indicator, was only due to not doing what the book tells us to do. No, CRM is not the beginning of the solution, it is the polish that must be applied to capable crew functionality. Knowledge and skills form the basis, with a healthy attitude or disciplined behaviour to ensure the correct knowledge and skills are applied. All of this is influenced by human factors, with CRM being the last veneer applied and polished to the best possible shine. ✈

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Gordon Dyne's deceptive Mirage

Since time immemorial, military organisations have had a need to confuse the enemy with regards to their strengths. This consisted of either camouflaging the asset to hide it or have decoys to draw the enemy away from the true forces or inflate the numbers of the forces.

By Charlie Hugo

Camouflage

The basic idea of camouflage is to hide or break up the outline of the aircraft or to allow the aircraft to blend into the background. Many aircraft, especially in forward areas had branches or simple hessian sheets draped over them to disguise their shapes. During World War II the camouflaging of assets was taken to the ultimate where the entire Lockheed Aircraft factory in Burbank, America was painted to resemble a complete suburb with roads, houses and plants painted on the roof.

Decoys

In contrast to camouflage where the intention is to hide your aircraft, a decoy is used to lure the enemy away from the true asset or is used in an attempt to inflate the numbers at your disposal. This varied from simple dugout shapes on the ground to wood and canvas replicas that served as decoy targets. Before D-Day on 6 June 1944, hundreds of rubber tanks, lorries and guns had been built and placed as decoys miles from where the actual invasion force was assembling.

During the apartheid era, the South African Air Force (SAAF) implemented an even more elaborate scheme. Our premier attack fighter of the time was the Dassault Mirage F1 and full-scale glass fibre and metal replicas were built and deployed at various strategic bases. The decoys included a gas burner inside the fuselage to simulate a running engine to deceive infra-red satellite imaging. It is unknown exactly how many of these decoys were built or where they were deployed. It has been reported that as many as thirty were built. It is known that at least four of these decoys are known to survive. They are located at 10AD in Pretoria, Vastrap Bombing Range in the Northern Cape, on a pole at the entrance to a farm near Nigel and the fourth one was on the roof of a factory in Heidelberg.

unsuccessfully approached the owner of the Heidelberg aircraft on numerous occasions to buy the Mirage for display at his man cave located at Benoni-Brakpan airfield. This was until earlier this year when he was told that the aircraft had been removed from the factory building and was possibly available for sale. Striking whilst the iron was hot, Gordon contacted the owner and confirmed the availability of the aircraft and a deal was struck. At long last Gordon was the owner of the object of his desire.

Now Gordon had to get his 'baby' home. With the assistance of various people, mainly Gary Freeman of Smart Machines and the traffic authorities, the Mirage was relocated from Heidelberg to Benoni-Brakpan. The deprivations of the years of exposure to the harsh African sun had taken its toll on the aircraft and Gordon arranged to have the aircraft refurbished and resprayed by Neil Fenton of Techneil as a representation of the original delivery scheme of these aircraft. A protective ceramic coat which will withstand the harsh elements for evermore was added by Wayne van Rooyen of VR Diesels of Middelburg. A further challenge reared its ugly head when it was discovered that the aircraft was too high to fit through the hangar door to the refurbishment hangar. None-the-less this problem and countless others were overcome with enough dedication and so Gordon's Mirage was completed.

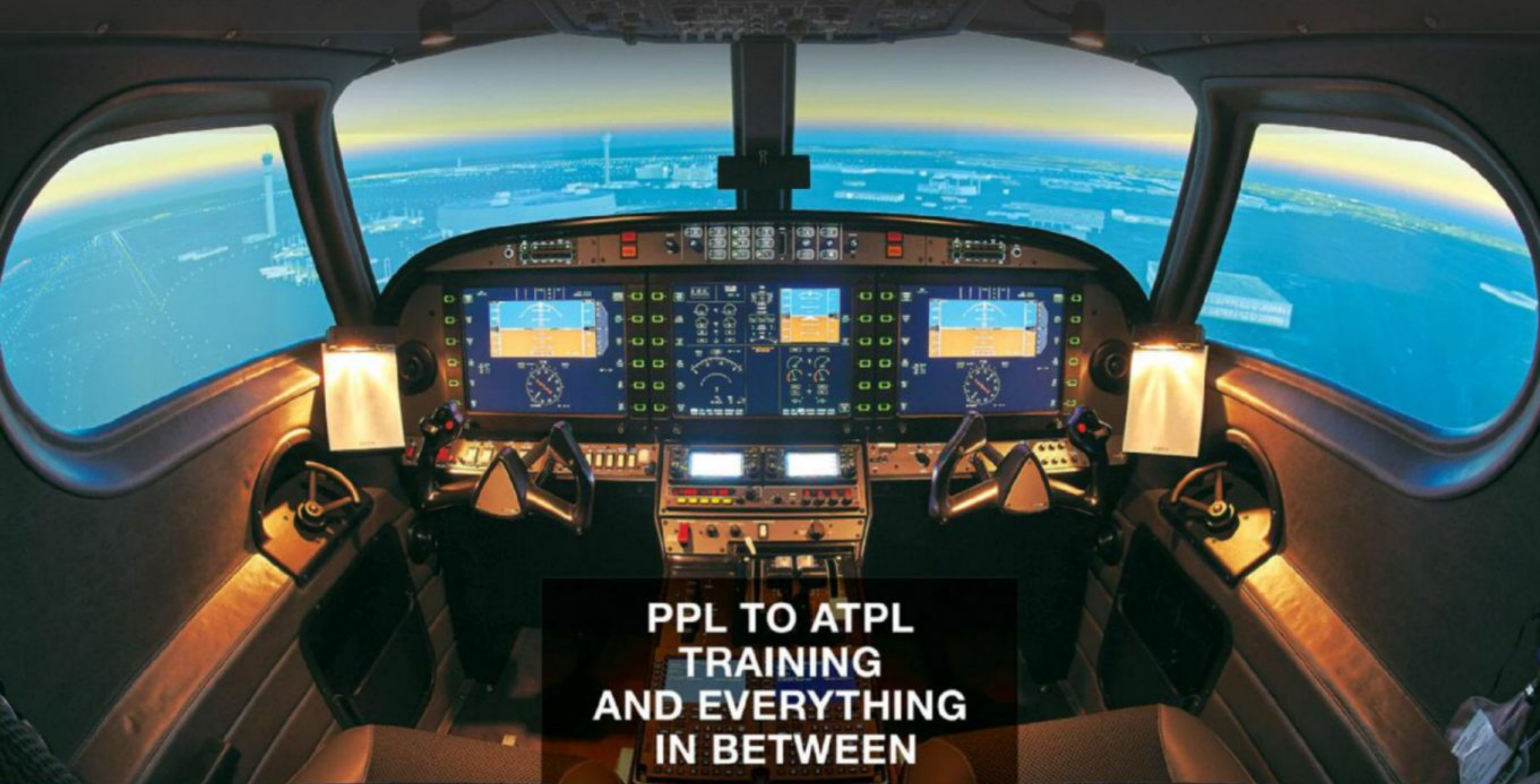
At a special function on 13 October (which happened to coincide with Gordon and wife Susan's 40th wedding anniversary) at Gordon's hangar and Man Cave at Brakpan airfield, attended by numerous friends of Gordon, icons in South African aviation and a number of former SAAF Mirage pilots, the aircraft was revealed. In a dedication to all the brave Mirage pilots who flew this iconic fighter in the Border war in the 1980s, the aircraft bears the names of two pilots – Captains Arthur Piercy and Mark Clulow on either side of the cockpit. Gordon is preparing a dedicated display area for the aircraft to showcase his 'baby.' The aircraft will be a big drawcard to Brakpan airfield for many years to come. Long may Gordon and others enjoy her. ✈

Gordon Dyne

Gordon is a long-time associate and good friend of this magazine and has for many years been hankering to own one of these decoys. He had



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WE ARE THE MASTERS NOW!

I was once told some years ago that if one wants to find out who runs an organisation, the quickest and most accurate way was to look at the number of telephone calls received by the individual managers and their staff. The one with most calls, even at a low end of the hierarchy, was the one who was actually running the company, although today the number of e-mails received and sent would probably be more accurate than phone calls. So, who runs your company? Who controls your organisation?

I was moved to write this article whilst reading a book written by a Russian Professor of Theology, as one does! His name is Alexei Osipov who was born in 1938 and is still going strong. The book is named 'The Search for Truth on the Path of Reason. What attracted my attention was a paragraph which rang loud existing bells in my mind concerning who controls what. 'Modern scientific/technological progress, Osipov writes, is bound up with the possibility for total control over every person,

even to a large extent, over his behaviour. In the opinion of a number of computer technology experts, there already are real possibilities for mass control over people. They confirm that the institution of a system of total computer control on our planet is not so far off and will be completed somewhere between the years 2010 and 2020.'

Events had clearly come a long way since the time of the film producer, Samuel Goldwyn of MGM fame. On a visit to England just after World War II he was being shown around a stately home when he spotted an object on the back lawn. "What's that?" he asked. "That is a sundial, Mr Goldwyn," said his guide. "What does it do?" Samuel replied. "It can tell the time by sunshine," said the guide. Samuel sighed. "Whatever will they think of next?" he said. However, my story is nothing to laugh about. More and more, those who once had considerable autonomy in their work find that much of it has now been lost, and the process continues. In fact, there is a grim likeness of this trend in our age which is uncannily close to what was written by George Orwell in his book '1984' which was published in 1949.

There is another aspect to this uneasy trend. Modern neurology has now discovered that the left and right frontal lobes of the brain have different functions. The left side of the brain performs tasks that have to do with logic, such as in science and mathematics. The right side performs tasks that have to do with creativity and the arts. More and more, it seems that education is largely aimed at the left lobe, and that the right lobe is being badly neglected. Although not mentioned in the description of the activities of the right lobe, in my experience it is also the home of intuition. More than once in my practise of Medicine, I have felt uneasy and admitted the patient to hospital even though



there was apparently nothing much to find. One patient, whom I will never forget, was a three-year-old girl who I sent for admission to hospital with nothing much to find, but a high temperature and who died in hospital twenty-four hours later from adrenal glands failure caused by a virulent virus. Another woman was adamant that she wanted her first baby to be born at home. Again, there seemed little to worry about, but I just felt that she should have her baby in hospital.

She eventually accepted my advice with rather bad grace, went into hospital to have her baby, where she had the worst post-partum haemorrhage that I have ever seen. Had she been at home, she would have undoubtedly have bled to death.

At this point, you may feel that all this has not much to do with aviation. However, read on. I know that when I was flying full-time, sometimes, even if nothing seemed to be wrong, I just felt that something, somewhere, was not quite right and took precautionary measures, such as diverting. With some of them, it was just as well that I did, so I am very aware of my intuition and hope it keeps working!

Coming closer to home now, how far have computers changed things in the South African aviation world? I can only write about my experiences in dealing with the South African Civil Aviation Authority (SACAA) concerning medical matters, but like most Civil Aviation Authorities, it started in the military world like many other CAAs. Also, as in most countries, it was eventually demilitarised and became an autonomous body in its own right. However, although those now in charge in South Africa tried their best, they made a big mistake in not recruiting the SAAF medical officers who used to carry out pilot examination for licensing and who had a wealth of knowledge and experience in this complex field. Next to come was worse, when it was decided to change the way of sending the completed documentation to the SACAA. Instead of putting the documentation into the post, all the Designated Aviation Medical Examiners (DAMEs) had to learn to use a computer programme so that the results could be sent directly to the SACAA. Theoretically, it should have been better than the postal route. However, from the

start the more senior DAMEs found it difficult, particularly if they were not computer literate and also because they were taught the programme, which could in no way be described as user-friendly, by the computer company staff who had no experience of aviation medicals and not by the SACAA staff.

I had already been through all this. At the time I had been working for the UKCAA at Gatwick when they computerised the system for dealing with medical findings. However, there were major differences. Firstly, UK AMEs and the CAA staff were more computer literate advanced than in South Africa at that time and secondly, we were taught about the computer programme by the UKCAA staff rather than the company which provided the software. This was a crucial prerequisite, as most of the AMEs already knew the CAA staff because they were frequently in touch with them and those CAA personnel were hugely helpful when it came to what was a major change in procedure. However, the real major change is that if you have a group of people who know their jobs and have been doing the same work for years, the last thing you want to do is to turn everything upside down by introducing a computerised system when the existing system is still working. Just because you computerise, it doesn't mean that your new system will work like you hoped it would and its drawback is

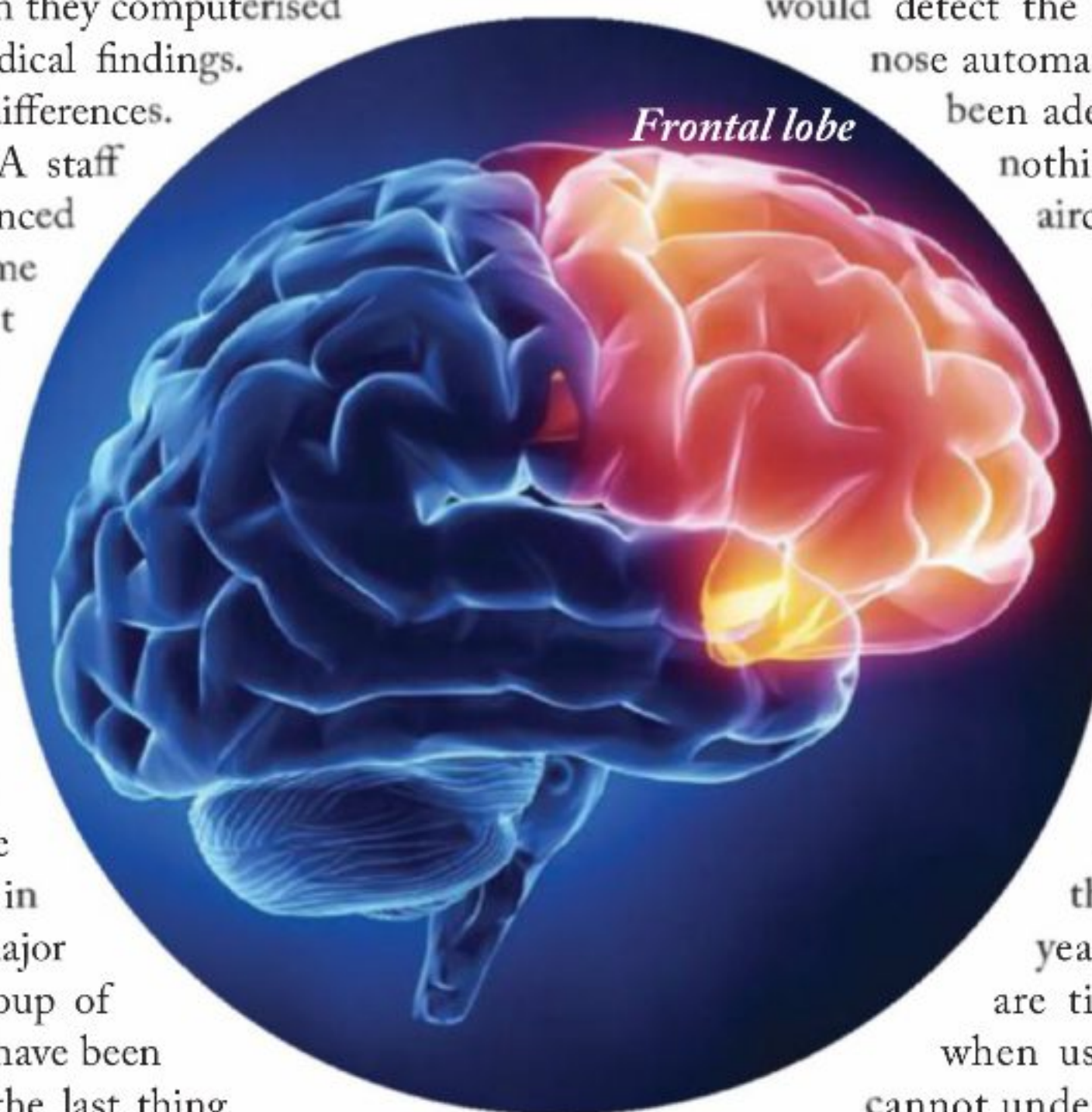
that those who have been using the system for years will lose their confidence and replace that confidence with uncertainty.

Another example of computer-induced loss of confidence was provided by Boeing when it fitted engines to their 737s which were too big for the airframe and caused the aircraft to pitch up after take-off. Being then installed a computerised system which would detect the pitch-up and correct it by dropping the nose automatically. Unfortunately, not all the pilots had been adequately briefed about the new system and nothing can disturb a pilot more than when his aircraft starts doing things he hasn't ordered.

There are few more crucial needs for confidence than when a pilot thinks he is in full control and suddenly finds that he isn't! However, if he doesn't clearly know what is happening, any confidence he might have had will evaporate and disaster will follow as sure as day follows night.

At their best computers can work miracles, and do in microseconds what the old methods would take months or even years to do. However, at their worst, they are timewasters beyond compare, particularly when used by those who either do not read or cannot understand the instructions.

All computers should have little flags flying over them with 'Keep it simple, stupid!' stamped on them. Then of course, there is the Eskom effect on computers, but we'll leave that to another day ...! ✈



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Puma LE builds on the combat-proven Puma AE legacy unmanned aerial vehicle (UAV) with new capabilities, increased range and expanded payload capacity. With the integrated Mantis i45 gimbaled EO/IR sensor and NVG-visible laser illuminator, Puma LE provides the war fighter with superior imagery for intelligence, surveillance and reconnaissance (ISR) during day, night and low-light operations on land and in maritime environments.

Delivering Group 2 capabilities in a Group 1 footprint, the UAV weighs only 22.5 pounds and is launchable by hand or bungee, making Puma LE easy to deploy and recover. On-board batteries provide 5.5 hours of flight endurance, doubling the time on station of Puma 3 AE, with an operational range of 60 kilometres when used with AeroVironment's Long-Range Tracking Antenna (LRTA). Puma LE's economical dual-case mission pack contains everything needed to perform two complete 5.5-hour missions with a single aircraft and Ground Control System (GCS).

Puma LE is purpose-built for multi-mission operations with up to 5.5 pounds of total payload capacity. The aircraft's ruggedized (hard wearing and shock resistant) secondary payload bay enables the

integration of third-party payloads with a dedicated power supply providing 18-24 volts at up to 5 amps and an Ethernet connection port for payload communications. This capability provides the flexibility for operators to incorporate specialised payloads such as electronic warfare, RF emitter geolocation, laser designation, communications' relay and others.

Puma LE can be operated manually or autonomously with AeroVironment's common GCS. Puma LE utilises plug and play, interoperable line-replaceable unit (LRU) components that can be shared with other Puma AE aircraft. This native compatibility reduces training and logistical impact for operators. In addition, current Puma AE customers can now optimise their fielded systems by purchasing Puma LE as an add-on aircraft and easily installing Puma AE LRU components. Multiple Puma LE system options provide the flexibility for customers to choose the right configuration based on mission requirements. AeroVironment is now accepting orders for Puma LE, with expected delivery in Q2 2020. 📍



SCHIEBEL

CAMCOPTER® S-100

successfully concludes SAR flight trials in Norway



The integration of the shipboard Camcopter S-100 as well as its impressive search and rescue (SAR) capabilities to the Norwegian Coast Guard on board of the KV Svalbard was successfully demonstrated between 16 and 27 September 2019. The flight trials included a successful search and rescue mission, where the Vertical Take-off and Landing (VTOL) Unmanned Air System (UAS) Camcopter S100 and a manned Sea King helicopter teamed up in a simulated 'man overboard' operation.

The 'man overboard' dummy was found by the Camcopter S-100, which was equipped with the Overwatch Imaging PT-8 Oceanwatch wide-area maritime surveillance payload, the high-quality L3 Harris Wescam MX-10 real-time Electro-Optical / Infra-Red (EO/IR) camera and the Schiebel-designed harpoon system, which supports take-off and landing in conditions up to Sea State 5.

The images were transmitted in real time to the operational room on board of the KV Svalbard and a local land-based control centre via its Radionor's Maritime Broadband Radio (MBR) link where it was disseminated via the internet and broadcast to the Joint Rescue Centre. Subsequently, the manned helicopter retrieved the dummy from the water to the deck of the KV Svalbard.

Hans Georg Schiebel, Chairman of the Schiebel Group said

"This successful search and rescue trial is another great example of Schiebel continuously staying ahead of the curve. The S-100 is the only VTOL UAS outside of the United States that is routinely flying from ships and in addition it is capable of carrying a multitude of payloads, especially for maritime search and rescue missions.

The capabilities of the S-100 convince customers, given its compact size and it being able to scan vast areas for small objects.





WING DRONE DELIVERIES TAKE FLIGHT IN FIRST-OF-ITS-KIND TRIAL WITH FEDEX

For the first time in the United States, a drone has completed a scheduled commercial residential delivery to a home in Christiansburg, Virginia. The drone delivery was conducted by Wing Aviation, in collaboration with FedEx Express, as part of the US Department of Transportation's Unmanned Aircraft Systems' Integration Pilot Programme (IPP). This delivery of a FedEx Express package marks the launch of the first scheduled, commercial residential drone delivery service and the first scheduled e-commerce delivery via drone delivery trial in the United States. For the duration of the trial, Wing drones will transport select FedEx packages to qualifying homes in Christiansburg, demonstrating the benefits of drone delivery for last-mile delivery service. Wing has received the first authorisation from the FAA to conduct scheduled, commercial drone package delivery to residences.

"Innovation has been part of the FedEx DNA since day one and we are always looking for new and better ways to deliver the world to our customers' doorsteps," said Don Colleran, president and

CEO of FedEx Express. "For our customers in Christiansburg, this collaboration will test the latest innovation in the last mile of a residential package delivery. We hope that this latest addition to our delivery options will enhance the last mile service for urgent same-day deliveries, customers in rural or semi-rural areas, and other exceptional delivery needs."

Customers of FedEx who live within designated delivery zones in Christiansburg, Virginia and who opt-in to the Wing delivery service, will be able to receive eligible packages via drone during the trial programme, provided certain operating conditions are met. Wing's pilot programme also includes a collaboration with Walgreens, allowing programme participants to order health and wellness products through Wing's delivery app. FedEx is also participating in the US Department of Transport's Unmanned Aircraft System IPP in conjunction with the Memphis Shelby-County Airport Authority, conducting drone operations on airport property to generate data to help inform future UAS policymaking. ✈



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ALTI UNMANNED VTOL FIXED WING AIRCRAFT



Duran de Villiers, owner and founder of ALTI, conceptualised the first ALTI aircraft by using his years of experience in developing and manufacturing multi-rotor drones in an all-new way, to allow a fuel-powered fixed-wing aircraft the ability to take-off and land vertically. While the concept of a vertical take-off and landing (VTOL) fixed-wing aircraft is not new, ALTI is the first company to commercially offer an ultra-long-endurance unmanned VTOL system and have been shipping aircraft to customers around the world since early 2017.

ALTI is Africa's largest commercial unmanned aircraft manufacturer, specialising in developing and building the world's longest endurance vertical take-off and land fixed-wing unmanned aircraft suitable for all-day operations in a wide variety of applications and environments around the world. ALTI offers a complete fleet of three fixed-wing, runway independent unmanned aircraft with common C² (command and control station), flight times of up to 20+ hours and a variety of integrated cameras for industry-specific applications along with custom integration and development services. ALTI is at the forefront of the unmanned long-endurance VTOL market.

ALTI's fleet of VTOL fixed-wing aircraft, all follow the same tried and tested recipe in terms of features, capabilities and configuration. ALTI aircraft vary in size to allow clients to fly different payloads and longer endurance missions. The ALTI Ascend, at a two-metre wingspan, is the smallest aircraft with an endurance of up to six hours and has a payload capacity of around 600g. The ALTI Transition, which ALTI has been shipping since early 2017, is an industry-leading, three metre wingspan aircraft with an endurance of up to 12 hours in a single flight and caters for payloads of up to 1.5kg.

The ALTI Reach is a much larger platform with a six-metre wingspan and ultra-long endurance of up to 20 hours and a payload capacity of up to 7kg.

ALTI is based in Knysna, the heart of the Garden Route and has a full-time team of 16 passionate, driven and dynamic staff. "We are very blessed to be able to live and work here in Knysna, and we choose to do so for very obvious reasons. We are able to earn dollars, spend rands and enjoy a lifestyle that is very hard to find anywhere in the world," says Duran, owner of ALTI. 📍

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MISFUELLING AIRCRAFT

How often have you walked away to attend to other business whilst your aircraft or helicopter is being refuelled at an airport? The death of a prominent Tampa plastic surgeon in the United States prompted me to research this subject, produce this article as well as a safety video on the subject of misfuelling.



The experienced pilot Dr Daniel Greenwald is said to have requested then watched as a lineman filled his piston-powered Piper Aerostar with Jet A fuel. Dr Greenwald was killed when the Aerostar which he was piloting crashed shortly after take-off from the Kokomo, Indiana, airport. Robert Losurdo, who owns the flight instruction company for Greenwald was working, said he is convinced that Greenwald would never have intentionally asked the Aerostar to be filled with Jet A.

According to the NTSB's preliminary factual report on the accident, "the airport employee who fuelled the airplane, said he asked the pilot of N326CW which was on its approach to the airport, if he wanted jet fuel, and the pilot said 'yes.' When the airplane arrived, the employee pulled the Jet A fuel truck out and parked it in front of the airplane whilst the pilot was still inside. The employee said that he asked the pilot again if he was wanted jet fuel and the pilot again said 'yes.' The employee fuelled the airplane with about 163 gallons of Jet A from the fuel truck. The report noted that the fuel truck had prominent 'Jet A' markings on its sides and back.

The normal checks and balances are bolstered by the design of Jet A fuel nozzles, which are built to not fit into the filler ports of piston aircraft. Nevertheless, according to the NTSB prelim, "The FBO employee said that he was able to orientate the different shaped nozzle (relative to the 100 LL fuel truck nozzle) from the Jet A fuel

truck by positioning it 90 degrees over the wing fuel tank filler necks and about 45 degrees over the fuselage filler necks. He said the he initially spilled about one gallon of fuel during refuelling and adjusted his technique so subsequent fuel spillage was minimal."

All of this took place soon after the pilot landed and the airplane sat on the apron whilst the doctor conducted his business at the airport. The NTSB report continues, saying that: 'the employee who refuelled the plane was inside the fixed base operator building when he heard the engines start. After the engines started, the engines sounded 'typical.' The man said that he did not hear any radio transmissions from the pilot during his departure and did not hear an engine runup.'

Another pilot, who had received flight training from Dr Greenwald, said he drove the doctor back to the Aerostar and watched him as he 'visually checked the fuel tanks of the airplane and gave a 'thumbs-up,' according to the report. This second pilot 'heard the engines start and they sounded normal.'

The Aerostar crashed less than four miles south of the Kokomo airport and according to the NTSB, post-accident examination "revealed the presence of a clear liquid consistent in colour and order with that of Jet A in a fuselage tank and in the fuel lines leading to the fuel manifolds of both engines. Several of the engine spark plugs exhibited damage consistent with detonation."

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Responsibility of the pilot

Every year around the world a number of aircraft are refuelled with the incorrect grade of fuel. Fortunately, this error is usually detected before the aircraft takes off, but sadly as in this accident case study, this is not always the case. We continue to see reports of incidents and even aircraft crashes resulting from misfuelling. All pilots are responsible to ensure that the correct grade of fuel is uplifted into the tanks of the aircraft they are operating.

Good airmanship also ensures that the pilot checks the fuel content by dipping the tank to check the contents before and after refuelling, then the pilot should personally secure the fuel cap and not leave this to the fuel lineman.

All airport refuelling facilities have clearly marked bowsers or fixed base pump stations that are clearly marked **AVGAS** in **RED** or **JET A1** in **BLACK**. This means there is no excuse for allowing the aircraft of helicopter you are operating to be misfuelled. In addition, all fuelling installations have a clear glass receptacle that clearly shows the grade of fuel, which is blue in the case of **AVGAS** and a yellowish colour in the case of **JET A1**.

Avgas (aviation gasoline)

This fuel is used in spark-ignited internal-combustion engines in aircraft. Formulated for stability, safety, and predictable performance under a wide range of environments, Avgas is typically used in aircraft which use reciprocating or radial engines. Its formulation is distinct from motor gasoline, used in petrol motor vehicles, which aviators refer to as mogas. Although it comes in many different grades, in general the octane rating is generally much higher than motor gasoline.

By contrast Avgas 100-LL, is a highly refined form of gasoline for aircraft, with an emphasis on purity, anti-knock characteristics and minimisation of spark plug fouling. Avgas must meet performance guidelines for both the rich mixture condition required for take-off power settings and the leaner mixtures used during cruise to reduce fuel consumption. Avgas is sold in much lower volume than jet fuel, but to many more individual aircraft operators; whereas jet fuel is sold in high volumes to large aircraft operators, such as airlines and the military.

Misfuelling possibilities

Jet fuel into Avgas piston engine powered aircraft

If an Avgas powered aircraft is advertently refuelled with Jet fuel, there often will be sufficient Avgas remaining in the aircraft's header tank, fuel lines and carburettors to enable the aircraft to taxi and even take-off. However, when the Jet fuel reaches the engine, often at a critical time during the take-off stage, the engine will fail and cause a forced landing or worse a tragic accident with loss of life.

Avgas into turbine engine (Jet fuel) powered aircraft

A similar situation may occur if Avgas is placed into an aircraft which should have been refuelled with Jet fuel. Aircraft range will be reduced and the different combustion characteristics could lead to aircraft damage. It may be possible to fly a turbine powered aircraft on Avgas under certain conditions and with the manufacturer's approval.

Avgas into diesel cycle (Jet fuel) piston engine aircraft

In recent years, the risk of misfuelling has become more complex with the introduction of diesel cycle (Jet fuel) piston engine aircraft. Using aviation gasoline (Avgas) in a diesel engine aircraft rather than Jet fuel can result in serious consequences. Therefore, it is recommended that all aircraft are to be fitted with fuel grade warning labels adjacent to the over wing refuelling ports of the aircraft. These labels provide the best warning to operators of grade of fuel the aircraft requires every time it is refuelled.

What happens if your aircraft is misfuelled?

Because Jet A1 is heavier than AVGAS and there will be some mixing, but the Jet fuel will settle to the bottom of the tank rapidly. This means that it will be either gravity fed in the case of high wing aircraft or pumped by the fuel pump to the engine's fuel system. Do not start the engine, but preferably get the aircraft to the Aviation Maintenance Organisation (AMO) as soon as possible. The entire fuel system will have to be drained and the tanks flushed with the correct grade of fuel. Before the aircraft can take to the air again a long engine runup will be required to ensure that all traces of the incorrect fuel have been removed. However, what is very clear is that prevention is far better than the cure. Golden rules in aviation dictate that as a pilot you should never allow yourself to be distracted, especially by your cell phone at any critical stage of flight – even on the ground whilst refuelling. ✈



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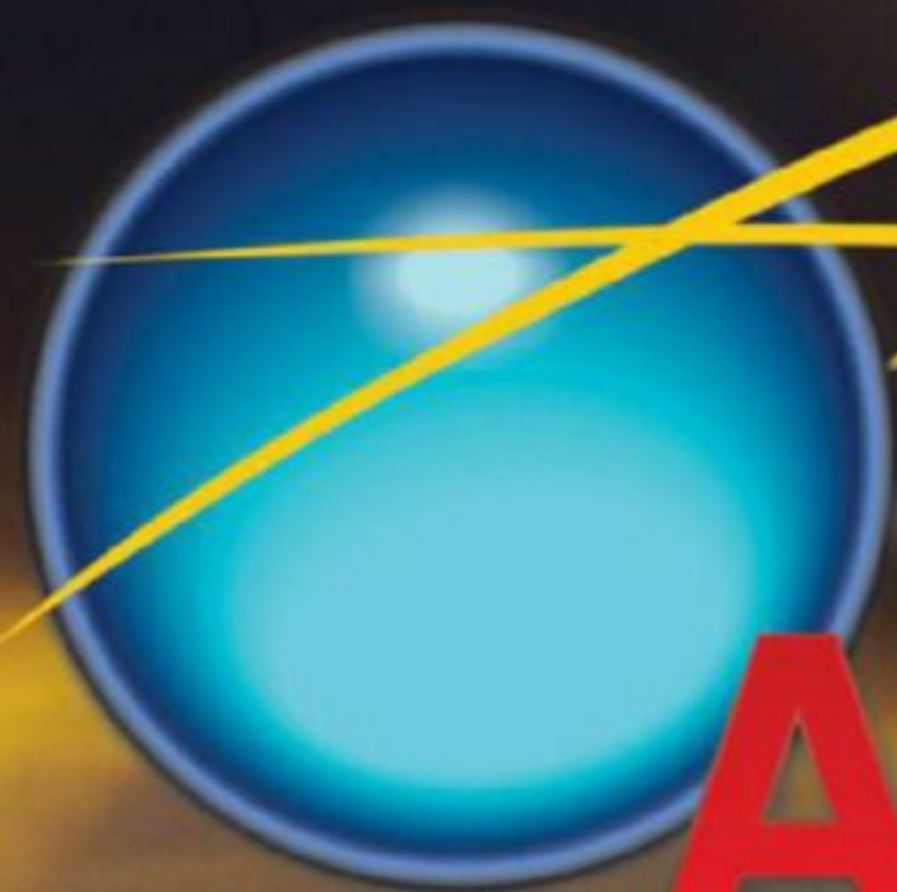


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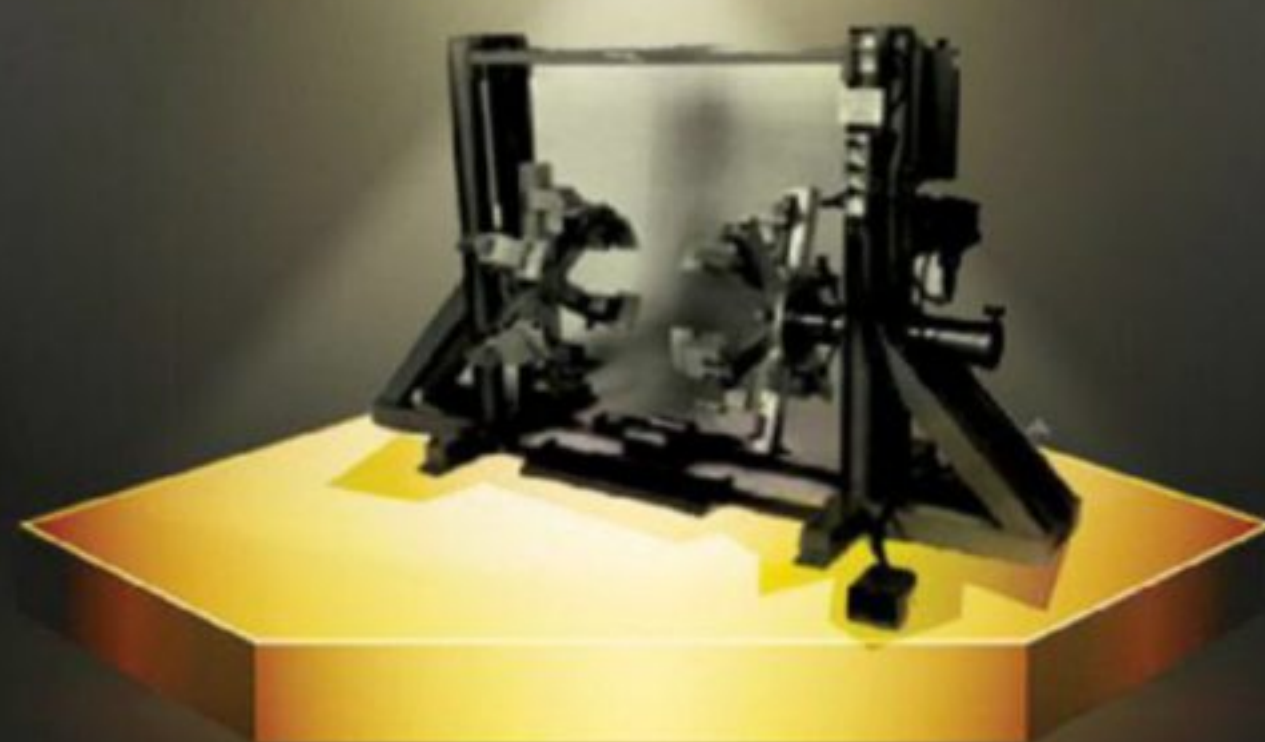
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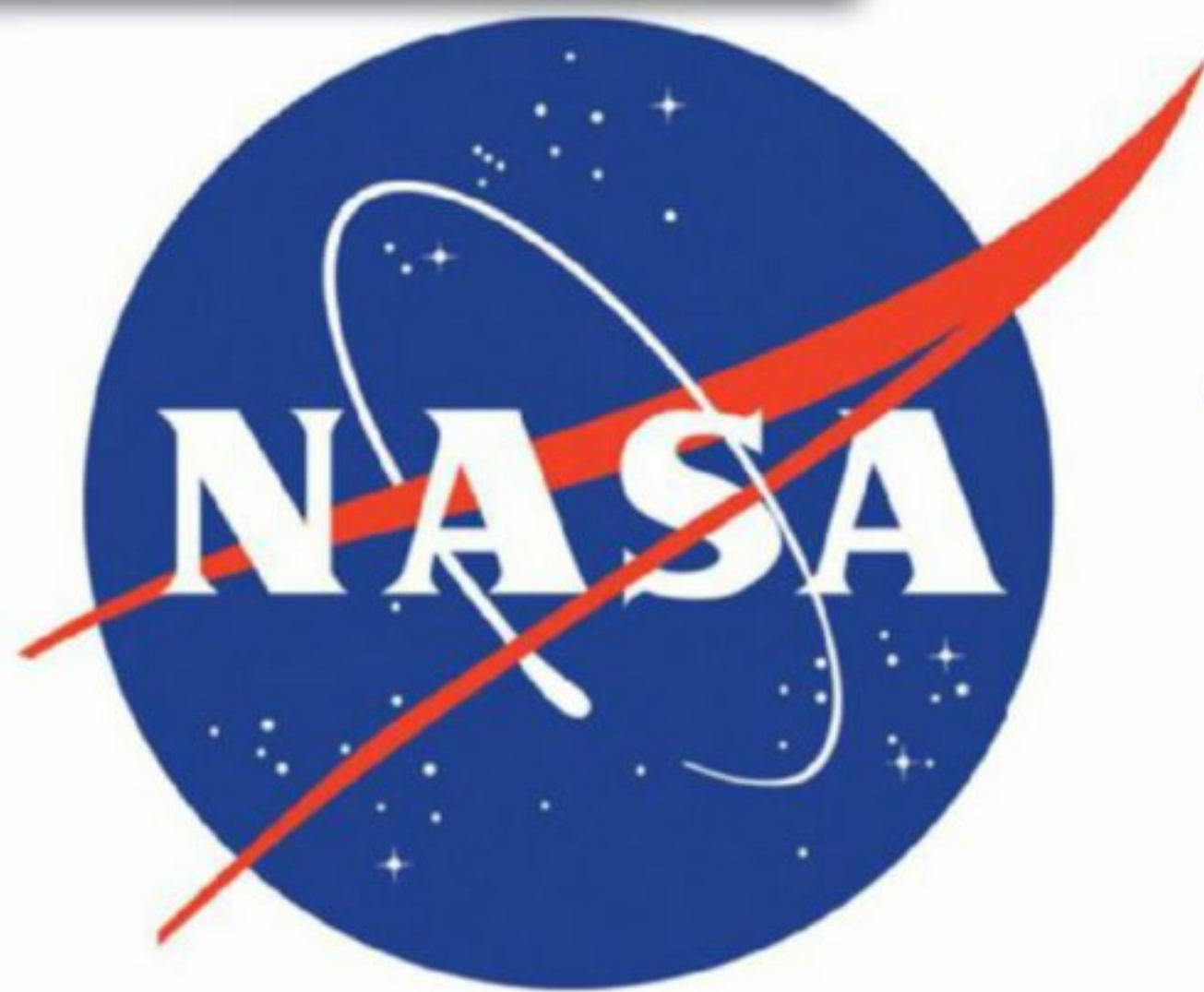
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supersonic X-59

QueSST update



Following years of research and design engineering, NASA believes it has come up with a solution on how to reduce a sonic boom. The agency has been working with defence contractor Lockheed Martin to develop the technology that can overcome current noise restrictions for commercial supersonic flight over land and pave the way for establishing a new market of air travel. The project is known as X-59 Quiet Supersonic Technology or QueSST and, according to NASA, it is already taking shape with assembly work ramping up towards the eventual first flight of the supersonic jet scheduled in 2021.

Presently the X-59, also known as the Low Boom Flight Demonstrator (LBFD), is being built and assembled at Lockheed Martin's Skunk Works factory in Palmdale, California. Once built, the X-59 will serve as an experimental single-pilot aircraft capable of flying faster than the speed of sound. The aircraft will be placed through a series of performance tests, including flight trials, before being deployed on flyovers over select US communities to gather data on how effective the new low-boom technology is in terms of public acceptance.

In April 2018, Lockheed Martin Aeronautics was awarded a \$247.5 million contract by NASA to design, build and test a quieter supersonic aircraft that produces a low rumble when it breaks the sound barrier, rather than the disruptive boom currently associated with supersonic flight. The factory, where the X-59 is to take shape, is the same that saw the birth of Lockheed's famed SR-71 Blackbird, the long-range, high-speed and high-altitude surveillance plane that was capable of flying at a speed of Mach 3.3 (2,510 mph) at an altitude of 85,000 feet and to date is known as the fastest plane in history.

According to NASA, the X-59 QueSST is designed to be capable of flying at a speed of Mach 1.23 (940 mph) at a cruising altitude of 55,000 feet; its new wing and hull design will produce a sonic boom of only 75 Perceived Level decibels (PLdB), which researchers believe will be acceptable for unrestricted supersonic flight over land. By comparison, the Concorde was capable of reaching Mach 2.04 (1,550 mph) at 60,000 feet with a sonic boom noise level of 105 PLdB.

Having completed the Critical Design Review (CDR) in September 2019, the next key test for the X-59 will come in December 2019, when an independent review board will present its findings and issues to be addressed from the CDR, at which point a recommendation will be made on whether the company should go ahead with the project. "The CDR showed us the design was mature enough to continue into the next phase and essentially finish the assembly," said Craig Nickol, NASA's project manager for the X-59 in a statement.

NASA is targeting the first flight of the X-59 QueSST in 2021 with initial trial flights of the jet; aimed at proving performance and safety (also known as 'flight envelope expansion') to take about nine months. Based on the success of these flights, the agency will officially take delivery of the experimental aircraft from Lockheed Martin. The next phase is acoustic validation, expected to run through spring of 2023, which will involve flying the X-59 over selected US cities and collecting data about community responses to the noise produced by low-boom flights. The data will be delivered to US and international regulators for consideration on new sound-based rules regarding supersonic flight over land.

In 1973 the Federal Aviation Administration (FAA) banned commercial aircraft flying faster than the speed of sound, or Mach 1. 🚫

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AP-2019/11

Share in AFOS Cessna 182

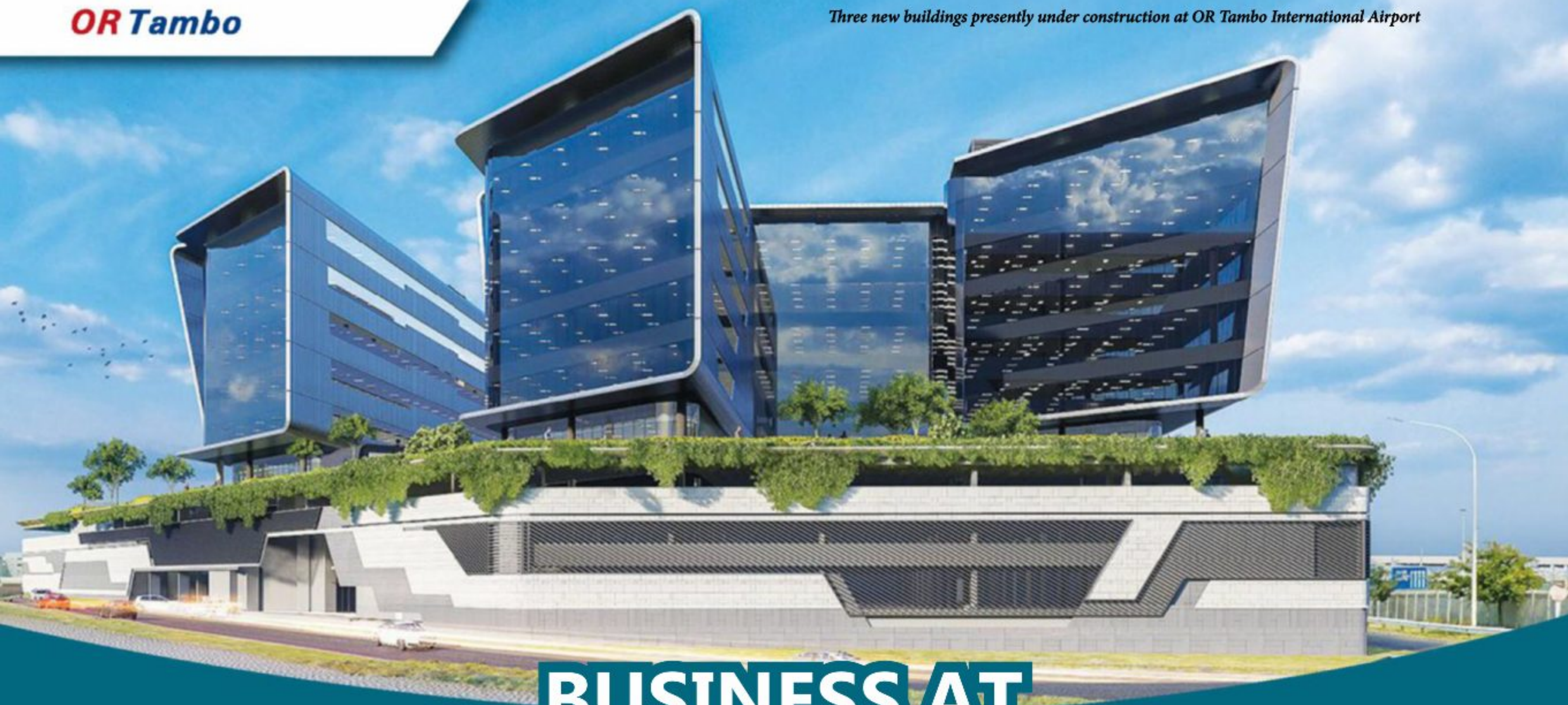
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BUSINESS AT

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OR Tambo International Airport is Africa's biggest and busiest airport, facilitating over 21 million passengers a year, whilst more than 50 percent of South Africa's air travelling passengers are facilitated through the airport.

A new R4.5 billion office complex is to be developed in the western precinct of the OR Tambo International Airport in the first of seven phases that will kick-start a massive plan for new cargo and passenger terminals.

Bongiwe Pityi-Vokwana, the airport's general manager, said that the first phase would comprise three six-storey office buildings that would be built on a podium and provide a total of 30 000m² of office space. Pityi-Vokwana said construction would take place on a site that was previously a shade carport parking area. Construction has already started and would be completed by the end of next year.

She said two of the buildings would house the head office of the Airports Company South Africa (ACSA), which is currently based in Bedfordview and the South African Civil Aviation Authority, which is in Midrand. Pityi-Vokwana said the third building would be available for rent and have common facilities that would make the

airport more attractive to local communities, such as a fitness centre, canteen and creche.

The airport is ideally situated in the heart of South Africa's commercial and industrial hub, with excellent road infrastructure, linking it to the national road network. On 26 November 2006, the Airport became the first in Africa to host the Airbus A380. The aircraft landed in Johannesburg on its way to Sydney via the South Pole on a test flight. OR Tambo International Airport is the pre-eminent air hub in Africa. It continues to serve as a gateway not only to South Africa but also to much of Sub-Saharan Africa. In addition, the airport links the continent to Europe, North America, the Middle East, the Far East, Australasia and South America.

OR Tambo International is also unique in that it is the only African airport with non-stop flights to all continents except Antarctica. Further to this, it is important to note that this airport, contributed no less than R5.6 billion to South Africa's economy during the 2018 financial year. The Airport supported 5,206 jobs in the country over the same period with a GDP contribution of R4 433m.

The Airport serves as the hub and economic engine for the country and the Gauteng City Region. Based on the forecast, the airport is demonstrating sustained passenger and cargo traffic growth over the short-to-medium term. Efforts have been put into growing connectivity and hence increased traffic at the airport and this has been made possible through collaboration with our partners, in the form of the Gauteng air access.

Airports Company South Africa is committed to not only serve as a transportation hub, but to become part of the Aerotropolis. The Midfield Cargo development serves as a catalytic project for the Gauteng city region Aerotropolis and the airport is committed to taking part and contributing to more catalytic projects. The key concept behind an Aerotropolis is not merely having an airport at the centre of economic activity, boosting aeronautical and non-aeronautical revenue streams, but rather to create value and increased sustainable long-term growth for the company and our stakeholders within a 20km radius around our airports.

The Ekurhuleni Metropolitan Municipality (EMM) took a strategic decision that the Aerotropolis concept be pursued to leverage the economic benefits of having the busiest airport on the African continent, the OR Tambo International Airport, located within its jurisdiction. The value proposition of this being enhanced economic growth, reducing the cost of business, skills development, further integrating the public transport network, integrated spatial planning, improved logistics networks and handling.

Key opportunities such as improving the brand of the region, investing in strategic skills development, transport networks also exist for capitalisation. The City of Ekurhuleni presented the approved Aerotropolis Master Plan in November 2015 at an Investor Forum held in partnership with Airports Company South Africa as a strategic partner. The plan details 21 catalytic projects to be delivered within the next 25 years, driving economic growth and expansion.

Of these projects, five are closely related to the airport and/or its operations. The master plan details key economic clusters that have been targeted including advanced manufacturing, cargo logistics and e-commerce hubs, retail, aviation, cold storage, training colleges, research and development hubs, ICT, a medical city and tourism. In addition to this, the enablement of two major landholdings is under way.

Important projects for the upgrading of OR Tambo International Airport:

- The viability of approximately 187 000m² of additional development rights was established. This application is for the western precinct of the airport and includes office, retail and hotel rights with a potential total aggregate investment value exceeding R4 billion. This building project ought to complete by end of year 2019.
- The International Passenger Terminal (Terminal A), is old and needs refurbishment. This has resulted in the saturation of some of our terminal sub systems such as the security passenger screening points and passport controls where passenger congestion

(i.e. long queues) is experienced during peak periods. A refurbishment programme to revamp, reconfigure the facilities in Terminal A including a rebalancing of the airline check in-counters, passenger security screening points and passport control counters to relieve congestion is approved and will be implemented once the designs are approved and technical teams appointed. The anticipated benefits include passengers being processed much faster.

- To mitigate the boarding gate congestion, which is a daily occurrence at the international passenger terminal, with multiple real time gate changes which result in confusion and frustration for the passenger, plans are afoot to improve the passenger experience by increasing the boarding gates for the departing bussed passengers in Terminal A. This extension will result in four additional bussing gates or 1600 square metres of additional floor area including queuing and circulation space.
- Baggage carousels at the international passenger terminal also require added capacity to accommodate the volume of baggage that arrives during peak periods especially when wide bodied aircraft such as the A380 arrive one after the other. To this end the airport will be increasing its capacity by installing a new Code F compliant baggage carousel.
- One of the other critical subsystems within an airport is the airfield and associated infrastructure where efficiency improvement projects are lined up. The airport currently processes well over 300 x aircraft crossing our departure runway (RWY 03/21R) daily, which impacts the aircraft processing departure rate. To reduce runway occupancy times and increase the hourly aircraft throughput rate, the airport is planning to construct a by-pass taxiway at the threshold of the departure runway (RWY 03/21R), additional rapid exit taxiways at the threshold of both runways and extend the existing Charlie taxiway to the threshold of the landing runway.
- The airfield infrastructure is also in need of additional capacity for the airport to accommodate the parking of long stay wide bodied aircraft (e.g. A380s / B747s) and address the saturation in peak hours which currently result in sub-optimal allocations and capping of potential air traffic movement growth. The airport is planning to build an additional nine Code F aircraft parking stands in MARS configuration which can accommodate 18 Code C aircraft.
- The new midfield Cargo Precinct Development will take place in phases, in relation to the cargo volume growth and facility demand. This location and phasing have been ear-marked within the airport's master plan. This approach will allow for cargo handling capacity of up to 750 000 tonnes in phase 1 in facilities of 75 000 sqm,



Artist's impression of future development OR Tambo



Artist's impression of future midfield development at OR Tambo International Airport

where parts can be used by most cargo operators including general cargo handlers, forwarding agents and specialised cargo handlers. The later phase 2 development will deliver the expansion of facilities up to 200 000 sqm and the associated cargo handling capacity to cater for up to two million tonnes. These facilities will be purposed for general, express and specialised cargo handling as well as forwarding activities. ✈



Present day aerial picture of OR Tambo International Airport



Fly
CemAir

CemAir is back in the air

On 17 October 2019 CemAir received its renewed Aircraft Operating Certificates from the South African Civil Aviation Authority (SACAA) meaning that CemAir can again operate commercial flights on its South African registered aircraft. As communicated previously, on 29 April 2019 the Civil Aviation Appeal Committee found that CemAir was illegally grounded by the SACAA on 11 January 2019. Despite the uncontested judgement, CemAir was unable to resume operations due to the natural annual expiry of the aircraft operating certificates on 28 January 2019. CemAir respects the authority and decisions of the Civil Aviation Appeal Committee, an independent panel constituted by the Department of Transport to adjudicate the actions of the SACAA. The 82-page judgement comprehensively deals with all allegations made by and all suspension notices issued by the SACAA.

CemAir is the only truly independent scheduled airline operating regional aircraft and provides services to smaller towns and regional centres. The airline is privately owned and receives no subsidy or funding from the State but rather contributes considerably to tax revenue. In February 2019 the airline employed more than 310 staff and was the only airline connecting Margate and Plettenberg Bay to major centres. CemAir voluntarily participated in the IOSA programme, the global gold standard benchmark safety standard for airlines devised by IATA and CemAir has enjoyed an impeccable safety record across all operations.



In November CemAir confirmed the reintroduction of domestic scheduled airline service in South Africa. From Friday 8 November South African skies will again have the familiar sound of CemAir across the airwaves. After a nine-month absence we are delighted to be resuming our services and truly hope to be able to welcome you on board soon.

CemAir offers all its customers an apology for the inconvenience suffered during the interruption of service. The lengthy legal process against the SACAA vindicated the CemAir operation and the Civil Aviation Appeal Committee has determined that no safety discrepancy was identified in the Company. CemAir has shared the details of the events through press releases and would be happy to answer any specific questions you may have. Again, CemAir looks forward to providing South Africa with a friendly and cost-effective airline service and connecting you to your favourite places and people.

Please visit the website for more information on www.flycemair.co.za

Comair Limited



Managed and owned by South Africans through its listing on the JSE, Comair has operated successfully in South Africa since 1946. This proudly South African aviation and travel group comprises four business units:

Airlines

Comair offers scheduled and non-scheduled airline services within South Africa, Sub-Saharan Africa and the Indian Ocean Islands, as its main business. The Group operates under its low-cost airline brand, kulula.com, as well as under the British Airways livery, as part of a licence agreement. kulula.com is the market leader in affordable, easily accessible air travel and continues to grow in the cost-conscious business and leisure markets. It has become one of South Africa's iconic consumer brands, while British Airways continues to grow in the corporate and public sectors, as well as in the inbound tourist markets.

Hospitality

Comair's catering service, Food Directions, originally launched to cater to the airline brands, now also provides a range of health and other food products to retailers. Its award-winning domestic and international SLOW Lounges have set the standard for airline hospitality in South Africa. The SLOW Lounge concept is based on the theme that time plays a significant part of life and the concept has been expanded to the SLOW in the City, SLOW XS and The Course facilities.

Tourism

Investment in technology to improve operational efficiency and offer innovative products to travel agencies and consumers has seen the Group become the country's largest digital travel distribution network.

The brands under the Group's tourism banner, include African Images, Holiday Travel, kulula holidays, mtbeds and Wild X.

The Group continues to form partnerships with industry leaders in travel reward and recognition programmes, as part of its objective to continuously expand and grow its business.

Training

The Comair Training Centre originally founded in early 2000 to train the airline's own flight and cabin crew, has grown considerably and now provides operational training for pilots and crew from other domestic and international airlines and even overseas air forces.

Comair acquired EPT Aviation Training (Pty) Ltd and Global Training College South Africa (Pty) Ltd in 2017 with the primary objective to enhance its already formidable proposition, increasing its capacity for external commercial training of cabin crew, passenger handling, and travel and tourism training. It holds benefits for not only Comair, but the many young South Africans who envisage a career in aviation.

In 2019, the Group consolidated its training portfolios and expertise into a single administrative entity, the Altitude Training Academy (Alt.Academy).

Technology

In 2018, Comair entered into a joint venture with an IT company, Infinea SA Holdings (Pty) Ltd, establishing a jointly held company called Nacelle (Pty) Ltd. Nacelle is a service provider in aviation and related sectors, providing services such as IT operations and support, IT project deployment, process design and software development.

Comair is the only known airline to have achieved operating profits for 73 consecutive years, has a safety record which is internationally recognised and a level 2 B-BBEE recognition. Comair has independently been certified by the Top Employers Institute as one of the Top Employers South Africa 2019.

For more information please visit **www.comair.co.za**



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Federal Airlines
Exploring new horizons



Fireblade Aviation is the culmination of a dream to host a world class facility for business aviation at the OR Tambo International Airport. With a pedigree of Aviation experience, dating back to 1936, the Fireblade Hospitality and Charter brand will not only offer diversification to the airport's clientele to include corporate flights originating from domestic and international origins but also offer strong and reliable aircraft charter options.

Fireblade has a state-of-the-art campus equipped with a primary passenger and crew facility along with two large hangars that will entertain the needs of just about any corporate aircraft. The FBO believes that it has created a leading global product and brand in Fireblade Aviation that is synonymous with the highest quality of service and attention to detail. Staff members are stakeholders in the business and passionate about aviation and service.

The convenience of "onsite" International Departure and Arrival processing makes the facility even more appealing to its clientele who are used to this service being available in most main airport hubs around the Globe.

Airside operations are well equipped with a proudly South African manufactured onsite Fuel Farm and fuel trucks. The primary tank holds 69,000 liters of Jet-A and distribution of the fuel is provided by two fuel trucks each with a capacity of 20,000 liters.

FBO One, developed by Amsterdam Software, powers management of fuel sales, inventory and all other front and back office business workflows. The software platform is being adopted in nearly every region including North America and the United States with Bangor, Maine being one of the first in the country to adopt the platform.

As a full-service Company, Fireblade Aviation also offers charter aircraft to clientele, domestically or internationally. The fleet consists of two single engine turbo prop Pilatus PC-12NG's that are ideal for the tourist market, a Challenger 350 regional midsize jet ideal for African business travel, an Agusta-Westland AW139 helicopter, an Agusta 119 helicopter and the intercontinental Global 6000 Vision by Bombardier.

All the aircraft within the fleet share a common paint scheme and together, are able to complete just about any mission that is called upon. The Fireblade Aircrew are handpicked, full time employed and are provided with a high standard of training. Our Cabin crew are skilled in tailoring customer preferences to ensure the onboard experience leaves a long-lasting smile to each guest after each flight.

In the words of our CEO, "We hope that those who have the opportunity to experience our facilities, aircraft, services and passion will agree that this is the premier facility on the continent."

Tel: +27 10 595 3920

E-mail: info@firebladeaviation.com

Website: www.firebladeaviation.com



Mega Aero Training Academy

Based at OR Tambo International Airport, Mega Aero Training Academy, heads to its 10th year in the aviation training sector and 2019's progress has been nothing short of amazing. As part of the Safomar Aviation Group, MATA management has shown growth and strategically set out new training courses available in the industry from around the world and of course constant and ever evolving inclusions of new material into training modules, so as to ensure that all students take part in all aspects of the course offerings are trained on the latest industry standards and material and investigation into technology hubs and world skills programmes.

MATA introduced EASA training through SR Technics with this new joint venture MATA and SRT can now train EASA B1 and B2 opening a world of opportunities for engineers and exposing them to better opportunities. Thus, training engineers for Africa and the world.

The theme for the year #womenwithinaviation has encouraged MATA to be part of initiatives encouraging more female students to join the aviation industry by choosing to study courses such as Aircraft Engineering. MATA's first initiative for the year started with the collaboration with STEM for WITS Integrated experience; where students were given an aircraft crash scenario and given an opportunity to explain with research and findings the reasons of the incident. In conjunction to the WITS integrated Experience, STEM also hosted a STEM Conference at the Dome in Northgate for students who are interested in Science, Technology, Engineering and Maths careers where MATA was one of the main sponsors for the event. MATA was proud to announce at the event that two bursaries were up for grabs for 2021 learners to study apprenticeship training for three years at the school.

With the strategic plans in place sufficient resources and time have been spent on attending airshows and in 2019 MATA attended five airshows across the country and Africa including the Nelspruit Airshow, Swartkop Airshow, Botswana Airshow to name a few. MATA has also focused on increasing its brand awareness through

social media platforms which has successfully resulted in an increase of potential students and enquiries throughout the year.

MATAs growth also resulted in having a class full of apprentices from Tanzania. The Tanzanian students have shown excellent progress throughout the year and MATA feels humbled to have hosted them and to help uplift fellow African countries evolve their aviation culture even more.

2019 also brought change where the first female director from MATA Ms Fiona Hall who was appointed as Mega Aero Training Academy's Director alongside Ms Glenrose Kganyago. Ms Hall has been with MATA for more than five years and has shown excellent leadership with her staff and mentorship with many other staff members across the Safomar Aviation Group.

Embracing the theme for the year #womenwithinaviation, MATA hosted its very first Women within Aviation high tea. The event was hosted to commemorate the amazing work done by phenomenal women within the aviation industry. A special invite was received from Natalie Le Riche Mrs South Africa finalist sponsored by Tammy Taylor SA and hosted by the City of Ekurhuleni. MATA is also the gold sponsor for Natalie Le Riche and proud to support her journey through the Mrs South Africa pageant that will be hosted in November 2019.

2019 showed that MATA has effectively contributed towards the aviation sector and continued to find new ways to grow. With 2020 being MATA's 10th year in the aviation industry, plans have been made this a year to remember. MATA plan to introduce new courses, being fully EASA accredited in South Africa, introducing online student system and attending the 2020 AAD exhibition.

Contact MATA Tel: (0) 11 395 4144

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Lufthansa Technik flying start in South Africa

With its significantly increased involvement in South Africa, Lufthansa Technik is making a substantial contribution to the development of the African aviation industry. The opening of the line maintenance stations by Lufthansa Technik Maintenance International (LTMI) in Johannesburg and Cape Town beginning of the year mark a flying start for the fast-growing footprint of the MRO provider on the African continent. In Johannesburg, the line maintenance station with a hangar facility at Denel Aviation at OR Tambo Airport and ramp offices at the apron have been in full operations since March 2019, providing all line maintenance services below C-checks for on six aircraft of one customer. With the further phase-in of one to two aircraft per month starting in 2020, growth is set to continue significantly. The line base in Cape Town can handle technical support below A-checks.

Committed to enabling excellent and more efficient MRO services in South Africa, the company is particularly committed to the transfer of its in-depth knowledge and its many decades of experience – Lufthansa Technik's DNA. Robert Gaag, Vice President Corporate Sales EMEA at Lufthansa Technik, is convinced: "Partnered with local expertise and local partners, Lufthansa Technik's broad spectrum of maintenance services for Airbus, Boeing, Bombardier and Embraer aircraft will contribute to more competitive and reliable aircraft operations in this region of the world."

To achieve its goal of autonomous operations, Lufthansa Technik tries to deploy local staff wherever possible and it has largely succeeded in doing so at the new line maintenance operation:

For the most part the approximately 50 staff are well-qualified local mechanics with extensive experience. In an ongoing training

programme, maintenance technicians are receiving further training to familiarise themselves with Lufthansa Technik's processes and standards. The aim is to ensure that they work even more efficiently and productively so to meet the local airlines' need for state-of-the-art performance. With the region's demand and capabilities growing, Lufthansa Technik expects another significant recruitment wave over the first half of 2020 especially for licensed engineers, unlicensed technicians and for various supporting functions.

Lufthansa Technik already has a number of major contracts with South African customers, initially focusing on long-term aircraft and component MRO services for the Boeing 737 and CFM56 jet engines. The company is also providing technical operations management on site. Furthermore, with the region's airlines service requirements evolving, Lufthansa Technik is set to expand its footprint accordingly. Further line maintenance stations are already planned at all major airports in the region, starting with Durban, Lanseria and Port Elizabeth.





EXCELLENCE IS CONSTANT ACTION, NOT A POSITION.

At Lufthansa Technik, excellence is part of our corporate DNA. For more than six decades we have been providing the technology that keeps fleets flying and turns a good aircraft into a great one. Today, we are proud that our company's name is synonymous with high quality and in-depth knowledge. And we continue to shape the aviation industry – by embracing new challenges and exceeding our customers' expectations.

CSABA MÉDER • MAINTENANCE PROJECT LEADER

Excellence in Motion



Lufthansa Technik



THE AEROSMENA CARGO AEROSTATIC THERMO-BALLASTED PLATFORM

The Airship-designing Initiative Design Bureau (Moscow, Russia), headed by Orfey Kozlov has developed a family of new airships with a carrying capacity of 60, 120, 240 and 600 tons. As a basis for the transport complex, a group of engineers decided to use a lens-shaped airship with the principle of thermos-ballasting. This aero platform belongs to the hybrid type of the new generation airship.

This airship does not take any special ground infrastructure, which is very expensive for operation. The Aerosmena allows for low cost of operation and manufacturing as an aero platform for the transport and logistics segment of the freight market. For example, the cost of the aero platform project with 60-ton payload from development to certification is in the region of US \$120 million, whilst the cost of the 200-ton platform will be in the region of US \$150 million.

By comparison, you can specify the programme of the aircraft Airbus Beluga XL with a lifting capacity of 50.5 tons. The development and production of such a transport aircraft required an investment of €1 billion. The cost of the programme to build a Lockheed C-130J Super Hercules transport aircraft (carrying capacity 37 tons) is estimated at \$ 1.4 billion.

The one flight hour cost will supposedly be 10-15 times lower than for the transport aviation aircrafts. Flight stability and reliability is provided by a specially developed control system that allows you to dampen any external air disturbances (for example, in the autorotation mode of helicopter propellers). Zero buoyancy of the unloaded aeroplatform is provided by the shell with helium in the upper part of the hull. To raise the payload (60 ... 120 ... 200 ... 600 tons), it takes to heat the volume with air by the exhaust gases' streams of 8 helicopter engines (the internal temperature will be up to 200 degrees). In the case of landing or maneuver, on-board "brains" are to regulate the heating inside of air "cavity" and take-off force (= Archimedean force). Therefore, payload aboard will be load / unload in the hang mode even, or after landing as usually even in the field condition. For landing it takes release hot air into the atmosphere makes the aeroplatform heavier than air which can be parked in the wild area without infrastructure.

The air-gas system incorporates original computerised control system and actuators (fans, valves, etc.). The cavities for helium gas are situated within the shell circumferentially -- symmetrically about the Y axis. Between the gas bags and the outer envelope there is cavities for the heated air, which provides for ballasting of the device.

In an aeroplatform, the buoyancy is created by 2 ways: as with the helium-filled balloon and with the heating air in the inside cavities as well in another part of hull. The flight is provided by the power plant, which rotates the helicopter and aircraft type propellers to create thrust. An additional flight resource is provided by aerodynamic forces (including vertical thrust screws, which can also function in autorotation mode).

To obtain a vertical thrust the aeroplatform uses the helicopter screws. The power plant provides the creation of the necessary control forces, allowing to effectively regulate the position and movement of the airship in flight with to all six degrees of freedom. The air platform has a static imbalance for the providing of the reliable landing in case of failed engines, as well as parking on the ground without mooring at wind impact to 15 m/s.



The bearing frame structure is made in the form of a bowl-shaped cross truss structure (made of light alloys or carbon fibre) with an outer ring (torus). In the center of the "cross" there is a hollow pillar (shaft) with an upper force ring, to hold the outer envelope. There is at the ends of the "cross" in the place (at the outer torus ring), the engines' package with propellers of vertical and horizontal thrust are installed. There are attached to the "cross" the removable suspended platform for equipment and payload, as well as the landing gear and mooring and mooring devices.

The entire flight programme hold by a multi-level on-board control system developed specifically for the Aerosmena project. To park, or land during operational acts the aeroplatform

bleeds out the inside hot air in the atmosphere and then the ship becomes heavier than air. To prepare for flight (even in the field), the Aerosmena airship takes 15 minutes.

The non-stop flight range of the airship is over 5000 km. The envelope icing is not possible, since hot air heats the entire surface of the body of the aeroplatform. The Aerosmena airship moves along an air trajectory (almost without interference) at a speed of 150-200 km / h (it takes some modification to increase the speed to 300 km / h).

The aeroplatform is equipped with a propulsion package, which provides a high level of stability in flight, as well as good handling and manoeuvrability of the Aerosmena ship, even with strong winds (up to 35 m / s). In full compliance with the requirements of flight worthiness by ICAO, this aeroplatforms' family has duplicated all onboard systems of the flight control and navigating. Such onboard equipment lets the airship flight very stability without risks.

When performing transport and logistics' tasks, the Aerosmena airship can work according to the door-to-door scheme, which significantly reduces the cost of technological operations for the transportation of cargo. Such aeroplatform is designed to provide the long-time aeroplatform hanging at a given point with stabilisation of given coordinates and altitude and also to take the takeoff and landing

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without a special ground infrastructure and even in field condition. Thus, the delivery and acceptance of freight can be provided both in the landing mode and in the hang mode. The airship is designed to perform various tasks: from passenger and freight transportation to delivering of the oversized cargo in the assembled condition (for example, full mounted hydroelectric turbines, power line towers, drilling rigs, etc.). For operational functional change, the aeroplatform operates by using interchangeable nacelles of various types (cargo platform, fire module, passenger compartment, mobile office, rigging crane, etc.).

The functionality of interchangeable cargo and special platforms in the Aerosmen complex

1. Loading platform to ship: - directly on the cargo platform; - on the external sling.
2. Passenger platform (all the possibilities for a comfortable flights of passengers).
3. Medical platform (autonomous mobile hospital).
4. Tourist Flying Yach (mobile Lux hotel)
5. Expeditionary (options are determined by requirements specifications, confirmed by orderers).
6. Building and installation operations (the works with special mechanisms and units).
7. Firefighting platform to efficient suppressing fire and people rescue.
8. Platform for courier and postal services (the deck is equipped for the autonomous drones' operations).
9. Platform for monitoring and control of land and sea surfaces (patrolling, search for minerals, search for submarines, sunken ships, mineseeeking, etc.).

The calculated economic efficiency of the aeroplatform is profitable than transport aviation aircrafts. The cost of a ton-kilometer for the innovative airship Aerosmena-200 (carrying capacity 200 tons) is estimated at \$0.3 as well but for the An-225 'Mriya' cargo aircraft (payload is 120 tons) - \$1.2.

The readiness to develop of the projects.

We had had successful negotiations with potential industrial partners. In particular, the famous Russian scientific and research aeronautic complex TsAGI is ready to participate in the project implementation (aerodynamics, appearance, calculations); research and production companies Saratov's KBPA, Moscow's ISMC Mars and Ulyanovsk's UKBP (flight control, flight and navigation complex) are ready too; Ulyanovsk's the Aviastar-SP OJSC or JSC DKBA (design documentation, manufacturing, testing) – in course of..

The Aerosmena specialists for the transport airship family had chosen the lenticular shape of the hull. Aerodynamic characteristics of this type of aircraft by researchers based on calculations, as well as testing models in the TsAGI wind tunnel, testing small-sized flying models.

The Aerosmena airship has advantages over other types of air transport. These specifics are next: - lenticular dirigible equipped with the hi-tech flight control complex, unlike cigara-shaped old-type airship, has significantly superior stability, controllability and flight maneuverability.

- payload is placed on the multifunctional cargo platform or on the external load hang system. The payload of the projecting Aerosmena airships is almost unlimited; the aeroplatform modul for the payload can be modified to use as base for drones for various purposes.
- the ability to perform vertical takeoff and landing, lateral (along the Z axis) and longitudinal (along the X axis) possibilities of basing on unprepared small-sized platforms (depending on the carrying capacity and dimensions of the platform platform);
- upon delivery of the payload there is no need for intermediate transshipments.
- low cost of transportation;
- providing a wide range of functional capabilities that provide autonomous (proper) means of loading / unloading and thermal ballasting of the device.

Manufacturing and testing of the first serial airship, approximately may take 30 to 36 months. The schedule of the certification procedures will be determined under accordance with the requirements specifications of the ordered airship. The project can be determined only after the coordination with the customer of the source data for a specific device. Analogues of the proposed development of the aircraft in the world currently does not exist. The main characteristics of the complex. The composition of the transport complex. The platform includes: - Hull (frame; outer shell; bags for helium; crew cabin with pilot and operator workplaces; containers for onboard equipment; flight-navigation complex; power package; air-gas system; docking devices and facilities to coupling for the suspension specialized platform; onboard cable; power supply system; mooring elements; lighting protection equipment; rescue equipment; light equipment).

- Specialised suspended interchangeable freight platform (platform base with with docking device to couple with the airship hull; household compartment (kitchen, lavatory, changing room, beds, first-aid post, storage room); payload compartment; chassis; freight ramps to load and launch drones from aboard and the further storage them; loading and unloading equipment; power supply system; firefighting equipment; mooring system; onboard cable). Central ground complex (ground control station includes workplace dispatcher / operator; ground handling kit; the operational point of logistics (provision of spare parts, auxiliary transport and fuel and lubricants); power supply system; fire and medical services; gas supply system; housing complex for attendants).

The power plant (8 engines with air helicopter and aircraft propellers with variable pitch as propellers, which provide control of the magnitude and direction (including reversal) of vertical and horizontal (due to skewing of the propeller blades) thrust; screws control the movement of the device relative to all six degrees freedom of movement.

Characteristics of the device with a loading capacity of 60 tons - take-off weight: 140 tons;

- Empty weight: 42 tons;
- cruising speed (km / h): 120
- maximum speed (km / h): 150
- cruising altitude (m): 2000
- maximum flight altitude (m): 3000
- flight range at maximum payload (km): 5000
- hang height when working on the ground (m): up to 30
- wind speed during takeoff and landing (m / s): up to 25
- wind speed when parked on the ground (m / s): up to 30
- wind speed when working on the ground in hover mode (m / s): up to 15

In the process of preparing projects, the following work was performed.

1. The shape of the lenticular aeroplatform was developed, some models were tested in the MAI and the TsAGI wind tunnels, all project aerodynamic characteristics were confirmed. Mathematical models of the apparatus were developed and mathematical modeling of all flight modes was carried out. Formed flight control algorithms that take into account the static instability of the device and provide the specified characteristics of stability and controllability. Three flying models were manufactured (with a diameter of 1.0 m, 2.0 meters and 7.0 meters), and their flight tests were conducted, including at the Emergencies Ministry training ground, with confirmed positive results. A model with a diameter of 7.0 m was built and presented in 2011 at the Moscow International Aerospace Salon (MAKS-2011). To present we had prepared the technical requirements for the Aerosmena power package. In partly, we determined the types of engines and moving parts for the machines working with a carrying capacity to 60 tons payload (and too for 100, 200 and 600 tons payload). After agreeing and confirmation on the requirements specifications, the Aerosmena project team will be ready to start to build the first aeroplatform.

As part of the preparatory work, preliminary negotiations are held with potential joint-venture enterprises. Under the condition of stable financing the first regular heavy-duty aeroplatform Aerosmena will be manufactured and operated within the next 3 years. In Russia, there is specialised industrial base and a qualified developers. 📌

By Athol Franz

EAA Chapter 322 Chairman's dinner

On Saturday evening 2 November, Christine Brits and I attended the wonderful Johannesburg EAA Chapter 322 chairman's dinner that was hosted at the German Country Club in Paulshof, Sandton.



In all about 80 EAA members and partners attended this prestigious function, where Chapter Chairman Captain Karl Jensen's awards were handed out to EAA Chapter 322 members who had added value to the Chapter during the past year. These included builders of aircraft which flew for the first time during the year as well as those members who have supported the movement. Thank you to EAA Chapter 322 for once again recognising the media coverage that African Pilot provides on a regular basis, not only within the monthly magazine, but also within the weekly APAnews platform. I believe that I am one of the longest continuous members of EAA Chapter 322, after becoming a member way back in 1984, when I became involved in the once famous EAA Margate airshows as the EAA South Africa PRO.

Throughout the evening there were special moments that punctuated the achievements of the largest EAA Chapter in South Africa and indeed one of the largest Chapters by membership numbers in the world. I was personally thrilled that Neil Bowden was singled out as an EAA member who has forged excellent relationships with EAA America through his annual Air Adventure Tours to Oshkosh, now entering its 22nd year representing our country. What is also interesting is that I have travelled with Neil's annual Oshkosh tour for 19 years in a row and I believe that African Pilot has a fine reputation with organisers of the largest sport and General Aviation show and exhibition in the entire world.



The problem of finding a suitable person to take over the leadership of EAA Chapter 322 was highlighted by Karl as he will be stepping down as chairman at the November monthly meeting. In order to ensure continuity of the wonderful aviation movement of EAA, hopefully a suitable candidate will step forward to fill the large shoes of an outstanding chairman. Although I have been invited to participate as a committee or board member of several aviation organisations, my resolve is that as a member of the media this would not be appropriate. However, there is no reason why my publications should not support all organisations that represent civil aviation in South Africa.

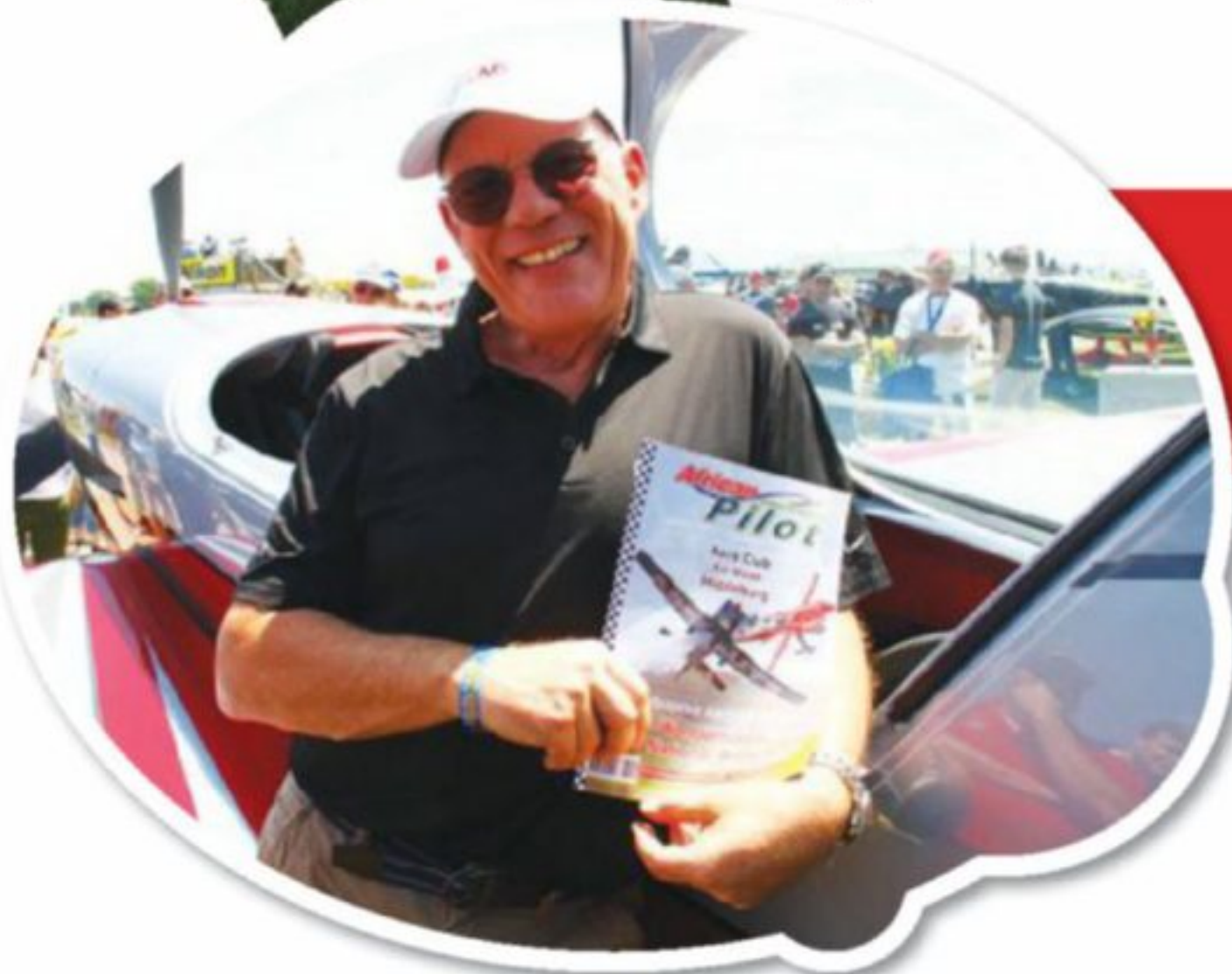
Awards were presented to the following people: Ryan Beckley, Willie Bodenstein, Neil Bowden, Eugene Couzyn, Michael Crause, Sean Cronin, Derek Frasca, Trixie Heron, Derek Hopkins, John Illsley, Richard Nicholson, Rob Jonkers, Paul Lastrucci, Nigel Musgrave, Ronell Myburgh, Marie Reddy, Arjan Schaap, Stephen Theron, Patrick Watson and me. Unfortunately, only nine of the twenty recipients, including me, were present to receive their certificates. However, EAA has undertaken to see that the other recipients will receive their certificates of recognition in due course. ✈

Extra Aircraft's next generation airplane obtains EASA type certificate



Extra NG at Oshkosh 2019

By Athol Franz



Walter Extra introduces the NG



On 11 October 2019, in one of the hangars at Walter Extra's aircraft factory, EASA's head of the general aviation department, Dominique Roland, passed the type certificate for the all-new Extra NG to an overjoyed Walter Extra. After years of research and hard work, the latest model from one of the world's most renowned aircraft designers and producers became fully type-certified and ready to enter serial production in Europe. This handover was also remarkable as many insiders and fans of the aerobatic world will still vividly remember Dominique Roland and Walter Extra fighting out breath-taking duels for rank and honour at the world level in aerobatic competition.

This EASA type certificate for the Extra NG is not an extension of an already existing permit for an earlier Extra aircraft model, but a completely new certification for an all-new aircraft design. The Extra NG will open one's eyes to a whole new dimension of aerobatic aircraft featuring an all-carbon rigid base frame, a first in aerobatic aviation history. The Extra NG truly represents a quantum leap forward by offering its owners and pilots not just a stunningly beautiful silhouette, but also an ergonomically advanced cockpit combined with unparalleled and even more enhanced aircraft performance, which against the background of Extra's already immensely successful earlier models, really sets the standards for the significance of this statement.

Following the official handover of the type certificate, the flight performance of the Extra NG was aptly demonstrated to the assembled guests by the French ex-Armée de l'Air pilot and aerobatic world champion, Francois Rallet. Despite suboptimal flying weather conditions, he still put the NG through its paces in an impressive flight display. This performance has already begun to convince the clientele of Walter Extra as 15 of the +10g /-10g certified new aircraft have already been entered into the order book of the most successful aircraft manufacturer in German post-war history at a price of \$460K each. ✈

Walter Extra says this aircraft is more than worth it. I was fortunate to be present at the unveiling of the new Extra NG at EAA AirVenture, Oshkosh this year with Walter Extra making the announcement about his new unlimited aerobatics' plane.

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EAA Sun 'n Fun 2019 at Brits Airfield

Christine Brits and I decided to fly to the event in my Cessna 182 and camp over for the Friday and Saturday nights so that we could be part of the wonderful comradeship of EAA members throughout the weekend.



Brits Airfield aerial view

Again this year, many EAA members enjoyed the weekend of 8 to 10 November at the annual EAA Sun 'n Fun hosted by the Brits Flying club. Although the SA Weather Services had forecast stormy weather, once again its predictions were completely incorrect. There was some wind, but fortunately throughout the day the wind turned from an easterly cross wind to a more northerly straight down runway 20. Although there were some visiting aircraft on the Friday afternoon, most of these returned to the Coves for the night. However, on Saturday morning there were a few arrivals and by lunchtime I counted more than 65 aircraft, one Gyrocopter and four helicopters present. At around midday, I was treated to a brief Alouette II helicopter flight with James Bain to capture some overhead pictures when the airfield was at its busiest.

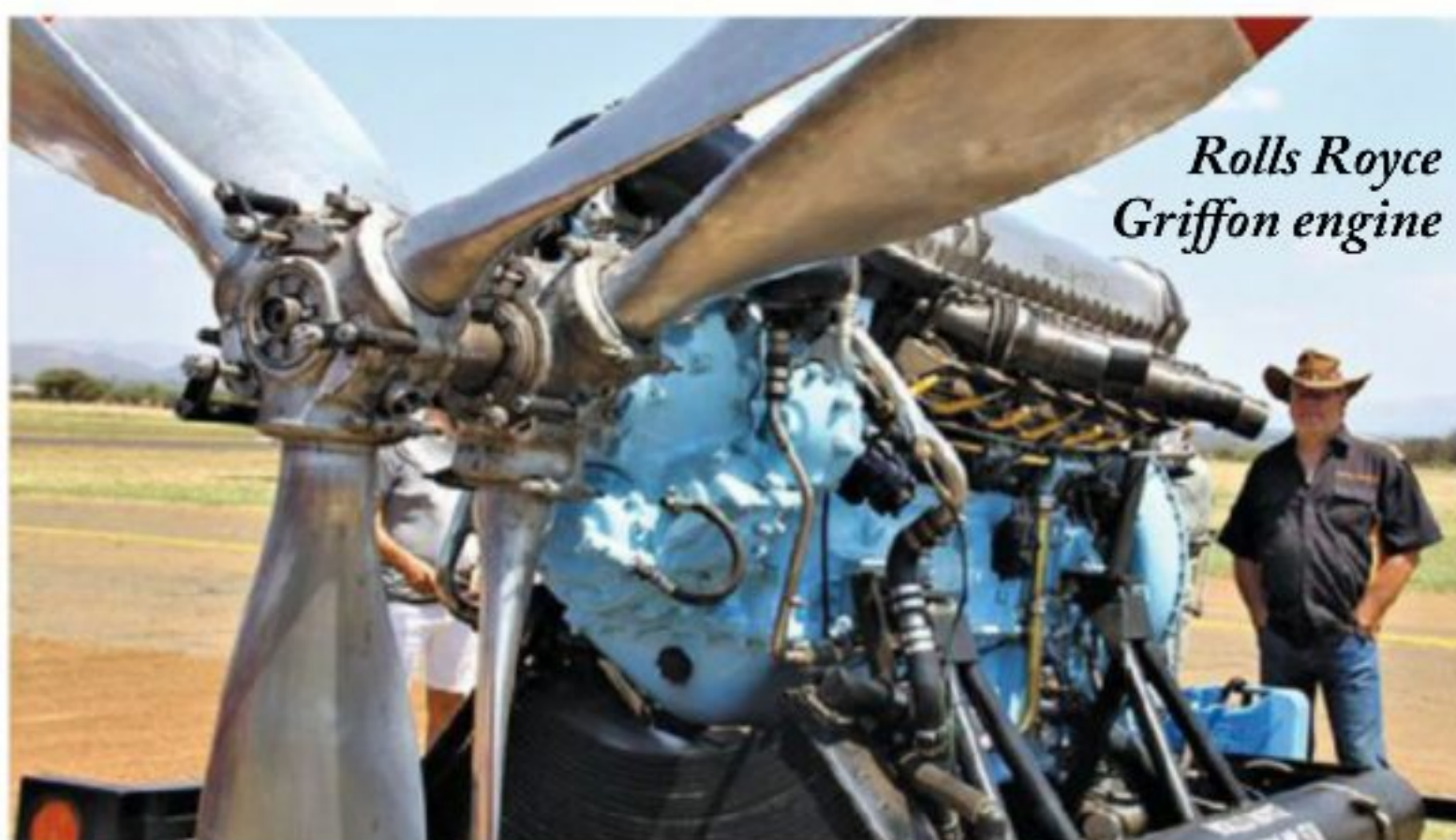
Later on Saturday afternoon, Rob Jonkers and I flew my Cessna 182 to take some air-to-air pictures of Neil Bowden's Sling 2 and Dave Lister's beautiful Rutan Long Eze overhead the beautiful farming countryside. Thank you Rob for flying from the right seat whilst I took the pictures from the open left side window. Both aircraft are featured in this article, but the pictures will be very useful when African Pilot features the two aircraft types in future magazines.

I would specifically like to thank the two Air Traffic controllers, Mbali Mndebele and Benji Phukubje who are both from Lanseria Tower. They did a terrific job of keeping the skies safe. Nigel Musgrave was the safety officer who together with his team of marshals controlled the parking of the aircraft. The event was always safe and was most enjoyable for everyone who attended.

Some of the exhibitors were Wings 'n Things Pilot Shop represented by Colin Blanchard and his son; Aviation Direct was represented by Andrea and Glyn Antel. DJ&A was represented by Werner Kruger and then of course EAA's ubiquitous Trixie Heron was selling caps and collectables which she always does so well. The Airplane Factory was represented by several owners of Sling aircraft as well as Kim Bell-Ross who flew a brand-new Sling 4-TSi to the event. One of the highlights of the day was the formation show on Saturday by Scully Levin and Arnie Meneghelli who flew two Puma Energy sponsored Flying Lions' Harvards. After landing, Scully and Arnie delivered an excellent talk on airshow safety, formation flying and general aviation airmanship, before they returned to Rand Airport.



Aerobatics formation



Rolls Royce Griffon engine



Winners of the spot landing competition

Due to the weather prediction for afternoon thunderstorms, many of the aircraft owners decided to play it safe and they departed shortly after lunchtime.

On Saturday evening, the overnight guests were once again treated to a delightful 'bushveld braai' with lots of hangar talk. Dr Frank Person brought out his music equipment for a karaoke sing along, but not many people participated so it was very pleasant to hear Frank singing and playing his guitar in the background. Although the night was windy, fortunately the rain stayed away so we woke up to a cloudy, but crisp dry morning on Sunday.

EAA Adventure Rally

By Rob Jonkers

Although only seven entries took part, there were a number registered that decided not to test the potential bad weather outlook, which in the end although windy, was good all weekend long. This rally is about teams enjoying the more relaxed and fun kind of event mostly involving observation out of the window recognition of ground features and learning about the area being over flown. For this year, the theme was the bushveld of the North West featuring the two key dams in the area being the Roodekopjes and Vaalkop dams, which lie in the Crocodile river valley and up to some of the foothills of the southernmost area of the Waterberg hills. The format was in the form of a pre-defined route map that was available prior to the event starting, for everybody to either plan his or her route with traditional map plotting tools or to programme the aircrafts' GPSs, if they were more at home following the magenta line.

For this year, as was seen in the Vryheid rally held earlier this year, navigation accuracy was also a criteria in the scoring, where a one km wide virtual corridor was established, where the teams had to make sure that they did not stray outside these boundaries as time penalties would be applied for the period outside the corridor. Each route's leg had turning point photographs to be recognised (either being correct or incorrect), mostly Google Earth photos, but still featured the same view.

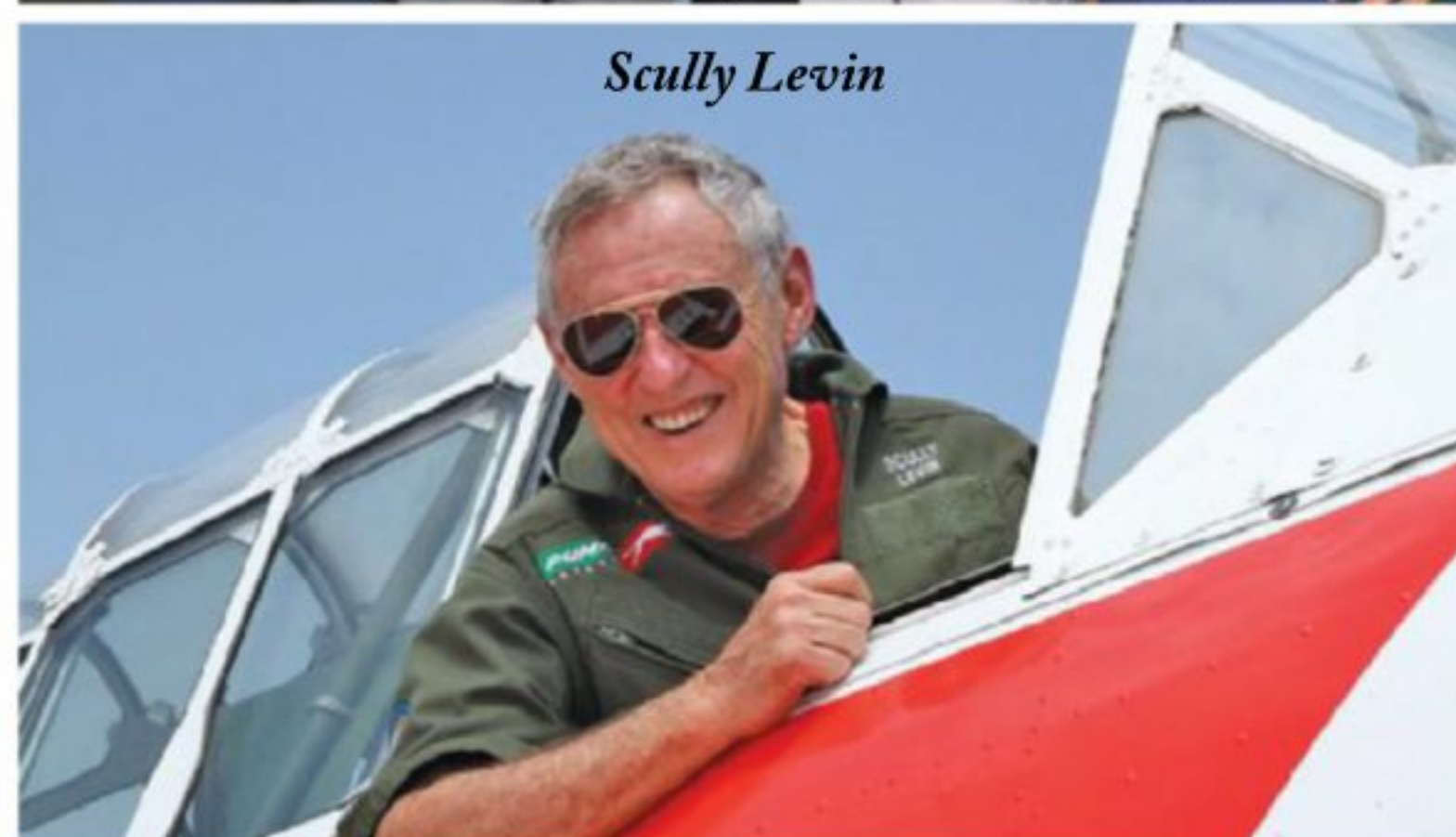
The booklet contained a section of wiki notes that would enable the crews to answer all the questions – with a warning; "Don't read at your peril..." and guess what..., some forgot to find the answers in the most obvious place... or were too busy trying to keep on track. After the briefing and with 20 minutes prior take-off with handing out papers, the first competitors took to the skies at 09h30, with the last off at 11h10. The weather was windy and hot, with plenty of turbulence over the route, but otherwise an excellent clear day for flying. All competitors found their way around and in general the scoring was good. With all aircraft back at the airfield it was time for marking the exam papers which was left to Mark Clulow to carry out, whilst I downloaded the loggers and scored the navigation accuracy.

On returning, the competitors had to carry out a spot landing where the landing line judge Dave Lister was on hand to adjudicate. Milan Daniz turned out to be the winner, with only 10 penalty points, landing in the first box before the 'bingo line.' Well done Milan. May I thank my assistants for providing outstanding preparation, complete with prepared booklets that contained all the information required by the pilots and navigators.

Finally, many thanks to all the entrants whose participation made for an exciting fun event. ✈️



Fun Rally winners Cathy and Alan Evan-Haynes



Scully Levin



Super Decathlon - picture by Christine Brits



Bat Hawk - picture by Christine Brits

Brits Sun n Fun Adventure Rally - Nav Results						
Position	Pilot Name	Navigator Name	Aircraft Make	Aircraft Registration	Nav Results	Nav Accuracy Results
1	Alan Evan-Haynes	Kathy Burke	Super Cub	ZU-ASI	33	6.0
2	Pierre Dippenaar	Martin Meyer	C162	ZS-IVC	34	4.5
3	Pierre vd Merwe	Mark Clulow	Sling 2	ZU-FWY	32	2.0
4	Bertie Lowers	Almero Calitz	M20J	ZS-LBS	28	1.0
5	Ian Wyldie	Conrad Walker	Savannah	ZU-ERJ	24	1.9
6	Milan Daniz	Caroline Koll	Sling 2	ZU-SLF	23	1.0
7	Johan Smit	Alex Smit	Sling 2	ZU-FWN	0	1

Brits Sun n Fun Adventure Rally - Spot Landing Results					Score
1	Milan Daniz	Caroline Koll	Sling 2	ZU-SLF	1
2	Pierre vd Merwe	Mark Clulow	Sling 2	ZU-FWY	7
3	Pierre Dippenaar	Martin Meyer	C162	ZS-IVC	15
4	Ian Wyldie	Conrad Walker	Savannah	ZU-ERJ	25
5	Alan Evan-Haynes	Kathy Burke	Super Cub	ZU-ASI	25
6	Bertie Lowers	Almero Calitz	M20J	ZS-LBS	25
7	Johan Smit	Alex Smit	Sling 2	ZU-FWN	25

Brakpan ANR (Air Navigation race) – 19 October 2019

The South African Power Flying Association (SAPFA) held a most successful ANR (Air Navigation Race) at Brakpan Airfield (FABB). This type of navigation rally event had not been staged at this airfield for a very long time. Initially this event was supposed to be the National Landing Championships with the venue at Brits airfield, but after the fantastic showing of our National Protea team in the ANR World Championships in Portugal in September and the chance for us all to watch them on live track, sparked a big interest in ANRs for our local members. It was thus decided to hold an ANR and combine it with the landing championships and to hold it at Brakpan which was an eminently suitable venue.

Jonty Esser raised his hand up to arrange the event, having returned from the Portugal campaign with fresh ideas on how to design ANR courses as well as knowledge of the scoring system. To be able to fit all this in one day, the briefing was planned for 08h00, with landings planned to start at 14h00, but as the interest to compete grew to 21 entries, it became difficult to pack so much into one day and with some risk of summer afternoon thundershowers, it was decided to drop the landing championships and reschedule this for another day.

The briefing eventually started at 08h30 after everybody had arrived, with Lizelle and Sandi taking and serving great breakfast orders from the new clubhouse bar and kitchen. The competitors were divided into two categories of Sportsman and Unlimited. Those competitors holding Protea colours automatically had to take part as Unlimited teams, whilst those who wanted to try their hand at international standard courses could choose to do so.

Within an ANR, there are only two objectives, the first being on-time at the start and finish gates, each second early or late attracts three penalty points. The second objective is to remain inside the corridor which the case of Sportsman Class is 0.4 nm wide (+/- 800 m), any excursion outside the corridor also attracts three penalty points per second outside the corridor.

For the Unlimited Class the corridors are narrower and the course layout with turns with sharper angles, and for this event the first course of the day was at 0.3 nm wide (550 m) and for the second course the width reduced to 0.25 nm (460 m), leaving little margin to keep inside this slither of airspace.

Each course is around 25 nm, so the course takes around 20 minutes to complete, but given the amount of concentration and focus required to stay within bounds, this is a very daunting contest. The navigator has the unenviable task of keeping the pilot on the straight and narrow, whilst the pilot has to keep checking that the navigator is doing his job. All the courses had 10 legs, which meant that on average the legs were around 1 min to 1.5 min in length, making flying these short legs quite daunting, as one is hardly on a leg when you have to think about turning onto the next leg, whilst keeping track of time.

Competition Director Jonty Esser briefing the teams on Saturday morning



Overview of the airfield



Adrienne Visser and Piet Meyer plotting



First off in the Sportsman Class was Johan van Eeden & Cor Esterhuizen in a C182 followed by the rest of the field in four-minute intervals on Route 1. Thereafter the Unlimited Class led by Martin Meyer and me departed the field, also in a C182 on Route 3. The weather for these mid-morning routes was good with a mild wind blowing from the North East, providing good results from the competitors. The next round of route 2 & 4 respectively started after midday where the wind shifted from the south, temperatures were over 30 degrees, with unstable air all around with thunder showers already building in the west, which made flying somewhat challenging in the turbulent air. After each flight a precision landing had to be undertaken, which proved difficult in the high-density altitude conditions and only two bingos were achieved. With everybody back in the clubhouse, Jonty Esser had the unenviable task of downloading the loggers and scoring everybody. Whilst the scoring was taking place, Santjie White, our guardian angel in aviation, was invited to give a talk on the Aeronautical Rescue Coordination Centre (ARCC), to provide information on this important service available to all aviators. Our grateful thanks go to Santjie for her talk and her time. We will also look at advertising these services and provide contact details on our websites.

In the Sportsman's class, first place in Navigation was taken by Johan van Eeden and Cor Esterhuizen in their C182 and first in the landing competition were Hilton Wolff and Grant Timms in their Mushak, with Dougie Inggs and Tyron Steenkamp in the rotor craft category in their Magni Gyro. Overall winners, where the navigation and landing scores are tallied up into a combined total, were as follow: -. 1st place went to Johan van Eeden and Cor Esterhuizen, 2nd place to Dougie Inggs and Tyron Steenkamp and 3rd place to Ray Wilford and Bernard Jansen in their Sabre. Well done all.

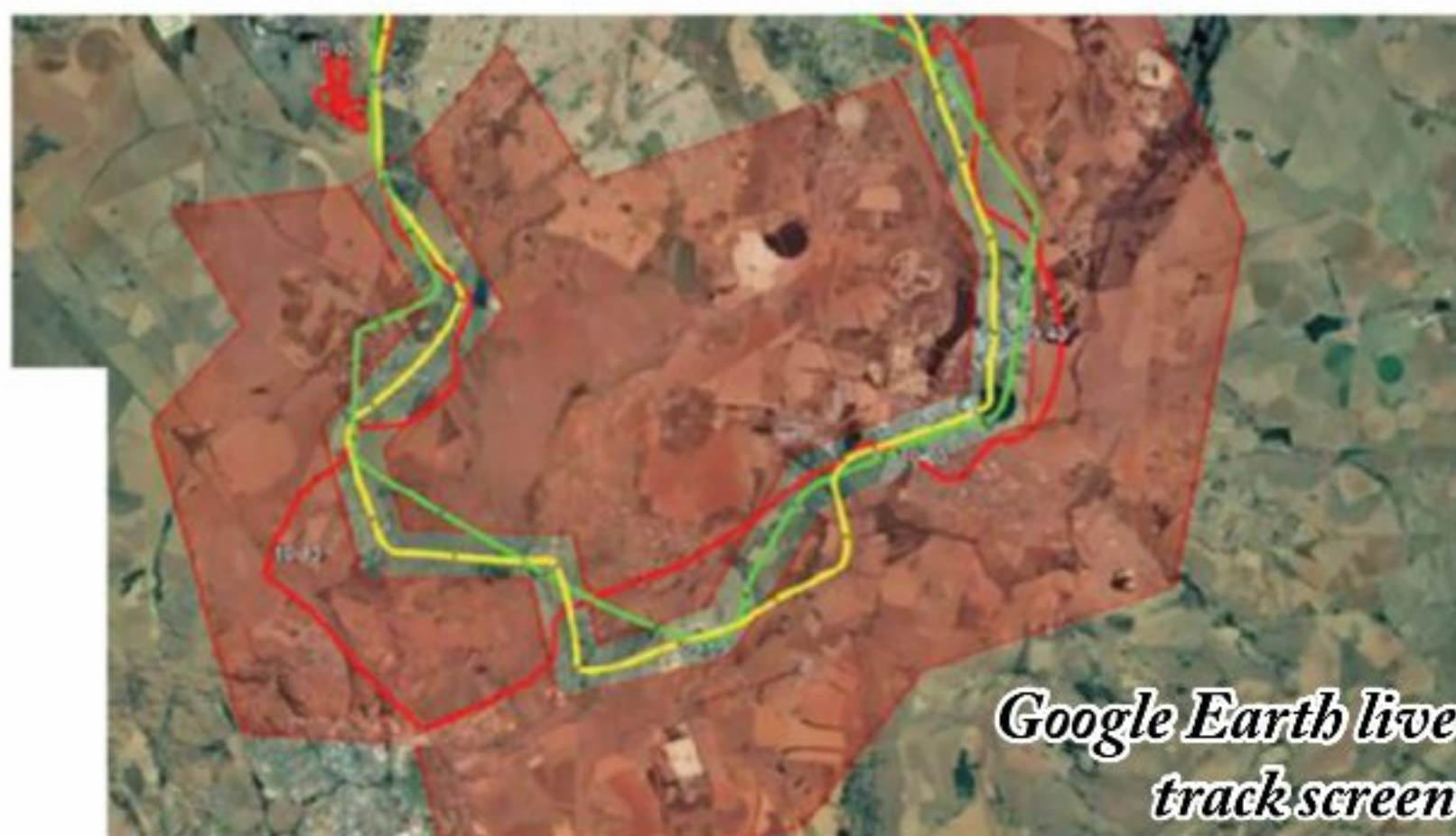
In the Unlimited Class, first place for navigation went to Martin Meyer and me in our C182. Most fortunate! First prizes for landings went to Hans Schwebel and Ron Stirk in their C150, with Rob Osner and Sandi Goddard in the rotor craft category in their Alouette 3. Overall winners when the Navigation and landing scores were combined were as follows. 1st place went to Hans Schwebel and Ron Stirk, 2nd place to Rob Osner and Sandi Goddard and 3rd place to Martin Meyer and me.

This event was enjoyed by all. Everybody wishes to know where and when the next race will be held. However, with a very busy 2020 calendar and the World Rally Flying Championship coming up as well, dates are at a premium, but we will see what can be achieved in the coming months. Thank you to all those who participated, the judges and the scorers who helped make this Brakpan day such a success. 🏆

*Father and son team
Hendrik and Jandre Loots plotting*



*Santjie White giving her ARCC presentation
to the competitors*



Unlimited Participants - Navigation & Landing Results							
Position	Pilot	Navigator	Class	Aircraft	Reg	Navigation	Landing
1	Rob Jonkers	Martin Meyer	Fixed Wing	C182	ZS-IVC	1103	290
2	Hans Schwebel	Ron Stirk	Fixed Wing	C150	ZS-NBT	1668	75 1st landing FW
3	Apie Kotzee	Frederik Kotzee	Rotor Wing	S44	ZS-HRS	1749	400
4	Thys vd Merve	Steve vd Merve	Fixed Wing	C172	ZU-AFP	1841	400
5	Hendrik Loots	Jandre Loots	Fixed Wing	Sling	ZU-INK	1961	232
6	Fiet Meyer	Adrienne Visser	Fixed Wing	Jabiru	ZU-DUU	2688	319
7	Rob Osner	Sandi Goddard	Rotor Wing	Alo 3	ZU-REC	2784	6 1st Landing RW
8	Shane Britz	Karen Stroud	Fixed Wing	Jabiru	ZU-FEP	5680	290

Position	Pilot	Navigator	Class	Aircraft	Registration	Navigation	Landings X10	Total
1	Hans Schwebel	Ron Stirk	Fixed Wing	C150	ZS-NBT	1668	750	3418
2	Rob Osner	Sandi Goddard	Rotor Wing	Alo 3	ZU-REC	2784	60	2844
3	Rob Jonkers	Martin Meyer	Fixed Wing	C182	ZS-IVC	1103	2900	4003
4	Hendrik Loots	Jandre Loots	Fixed Wing	Sling	ZU-INK	1961	2320	4281
5	Apie Kotzee	Frederik Kotzee	Rotor Wing	S44	ZS-HRS	1749	4000	5749
6	Thys vd Merve	Steve vd Merve	Fixed Wing	C172	ZU-AFP	1841	4000	5841
7	Fiet Meyer	Adrienne Visser	Fixed Wing	Jabiru	ZU-DUU	2688	3190	5878
8	Shane Britz	Karen Stroud	Fixed Wing	Jabiru	ZU-FEP	5680	2900	6580

Sportsman Participants - Navigation & Landing Results							
Position	Pilot	Navigator	Class	Aircraft	Reg	Navigation	Landing
1	Johan van Eeden	Cor Esterhuizen	Fixed Wing	C182	ZS-KUJ	733	200
2	Ala Busenwal	Enoch Musasizi	Fixed Wing	C172	ZS-SMB	1077	290
3	Ray Wilford	Bernard Jansen	Fixed Wing	Sabre	ZU-DYI	1291	242
4	Daniel Igou	Junior Fanti	Fixed Wing	PA-28	ZS-BFC	1333	305
5	Munsaf Sayed	Ricardo Baruffa	Fixed Wing	C172	ZS-OET	1700	205
6	Mubak Manaf	Zondo Zweli	Fixed Wing	PA-28	ZS-E3I	2174	361
7	Dawie du Toit	Johan Welman	Fixed Wing	Savannah	ZU-EYA	2234	249
8	Dougie Inggs	Tyron Steenkamp	Rotor Wing	Gyro Magni	ZU-EGA	2711	33 1st Landing RW
9	Kobus Botha	Jaques Botha	Fixed Wing	Dimona H36	ZU-EDL	2740	335
10	Phillip Gouws	Theo Greyling	Fixed Wing	Savannah	ZU-FIK	3000	400
11	Hilton Wolff	Grant Timms	Fixed Wing	Mushak	ZS-OKR	3904	135 1st landing FW
12	Julius Schwartz	Andre du Toit	Fixed Wing	SportCruiser	ZU-LSC	4880	233
13	Caroline Koll	Milan Danz	Fixed Wing	Sling	ZU-SLF	5115	400

Position	Pilot	Navigator	Class	Aircraft	Reg	Navigation	Landings X10	Total
1	Johan van Eeden	Cor Esterhuizen	Fixed Wing	C182	ZS-KUJ	733	2000	2733
2	Dougie Inggs	Tyron Steenkamp	Rotor Wing	Gyro Magni	ZU-EGA	2711	330	3041
3	Ray Wilford	Bernard Jansen	Fixed Wing	Sabre	ZU-DYI	1291	2420	3711
4	Munsaf Sayed	Ricardo Baruffa	Fixed Wing	C172	ZS-OET	1700	2050	3750
5	Ala Busenwal	Enoch Musasizi	Fixed Wing	C172	ZS-SMB	1077	2900	3977
6	Daniel Igou	Junior Fanti	Fixed Wing	PA-28	ZS-BFC	1333	3050	4383
7	Dawie du Toit	Johan Welman	Fixed Wing	Savannah	ZU-EYA	2234	2490	4724
8	Hilton Wolff	Grant Timms	Fixed Wing	Mushak	ZS-OKR	3904	1350	5254
9	Mubak Manaf	Zondo Zweli	Fixed Wing	PA-28	ZS-E3I	2174	3620	5794
10	Kobus Botha	Jaques Botha	Fixed Wing	Dimona H36	ZU-EDL	2740	3350	6090
11	Phillip Gouws	Theo Greyling	Fixed Wing	Savannah	ZU-FIK	3000	4000	7000
12	Julius Schwartz	Andre du Toit	Fixed Wing	SportCruiser	ZU-LSC	4880	2330	7210
13	Caroline Koll	Milan Danz	Fixed Wing	Sling	ZU-SLF	5115	4000	9115

register update

new registrations exported deleted

Information supplied by South African Civil Aviation Authority

October 2019

NEW REGISTRATIONS ZS - FIXED WING

02/10	ZS-TJK	Cessna T188C JFV Aviation
07/10	ZS-JON	Learjet 45 Private owner
11/10	ZS-TJL	Beechcraft King Air C90 GTI C en A Grondverskuiwing
11/10	ZS-TJM	Pilatus PC-12/45 Ringopro
28/10	ZS-LEV	Cirrus SR22T Private owner

Total: 5

NEW REGISTRATIONS ZT - HELICOPTER

22/10	ZT-REO	Eurocopter EC 130 B4 Ringopro
29/10	ZT-RPB	Bell 206L-4 BAC Helicopter
29/10	ZT-RTA	Bell 206L-4 BAC Helicopter
29/10	ZT-RTT	Bell 206L-4 BAC Helicopter

Total:4

NEW REGISTRATIONS ZU

02/10	ZU-IPM	Bat Hawk C Jazz Spirit 1113
03/10	ZU-KRI	KR1 Private owner
14/10	ZU-IPN	Vans RV 10 Private owner
15/10	ZT-REP	Airbus AS 350 B3 Airbus Southern Africa
15/10	ZS-RRT	Bell 222B Henley Air
22/10	ZU-IPO	Bat Hawk C Micro Aviation
22/10	ZU-IPP	Bat Hawk R Private owner
23/10	ZU-IPR	Raven Private owner

Total:8

EXPORTED ZS - Registrations

Date first registered

14/10/1975	ZS-JFA	Maule M-5-210C scrapped
24/12/1998	ZS-OIW	Maule MXT-7-180 scrapped
16/01/1998	ZS-AAC	Cessna 180J exported to Czech Republic
23/05/2014	ZS-HVJ	Agusta AW139 exported to Equatorial Guinea
12/02/1971	ZS-IJR	Cessna U206B exported to Madagascar
22/01/1980	ZS-KIW	Cessna P210N exported to United Kingdom
11/05/1995	ZS-MTZ	Cessna R172K exported to Canada
23/07/2014	ZS-TDB	GA-8 Airvan exported to United States
07/08/2019	ZS-TJH	Embraer EMB-120ER exported to Zambia

Total: 9



Airbus AS 350 B3



BatHawk



Bell 206 Jet Ranger

EXPORTED ZU - Registrations**Date first registered**

12/03/2010 ZU-FHR

19/11/2018 ZU-IOC

Total: 2Jabiru J430 exported to Zimbabwe
Savannah S exported to ZAMBIA**NEW REGISTRATIONS ZT - RPAS**

01/10	ZT-WDT	DJI Inspire 1 V2 SMQ Technical Services
01/10	ZT-WDU	DJI Phantom 4 Pro Skyhorse Aviation
01/10	ZT-WDV	DJI Matrice 600 Pro Council for Geoscience
01/10	ZT-WDW	DJI Mavic 2 Zoom DC Geomatics
01/10	ZT-WDZ	Quantum Systems Trinity Salaria
01/10	ZT-WEA	DJI Matrice 600 Salaria
01/10	ZT-WEE	DJI Phantom 4 Pro Timeslice Cinematography
02/10	ZT-WDX	DJI Phantom 4 Pro Salaria
02/10	ZT-WDY	DJI Phantom 4 Pro Salaria
02/10	ZT-WEF	DJI Phantom 4 Pro Salaria
02/10	ZT-WEG	DJI Phantom 4 Pro Salaria
03/10	ZT-WEK	DJI Phantom 4 Pro Salaria
07/10	ZT-WEL	DJI Mavic 2 Zoom Mesong Holding
07/10	ZT-WEM	DJI Mavic Pro Mesong Holding
07/10	ZT-WEN	DJI Inspire 2 UAV Technologies
07/10	ZT-WEO	DJI Phantom 4 Pro ECO Agri Consultants
09/10	ZT-WEP	DJI Phantom 4 Directional Survey and Mapping
09/10	ZT-WER	DJI Phantom 4 Directional Survey and Mapping
11/10	ZT-WEI	DJI Inspire 1 Mechatron Technologies
11/10	ZT-WES	DJI Inspire 1 DC Geomatics
11/10	ZT-WET	DJI Inspire 1 Incredible Technologies
11/10	ZT-WEU	Sensefly EBEE Plus Incredible Technologies
11/10	ZT-WEV	Parrot Disco Pro AG Peakfull 1181
14/10	ZT-WEW	DJI Phantom 4 Pro Premier Aviation
15/10	ZT-WEX	DJI Inspire 2 Step Above
15/10	ZT-WEY	Big Bird Phoenix UAV Industries
18/10	ZT-WFB	DJI Mavic 2 Pro Step Above
22/10	ZT-WFC	DJI Phantom 4 Pro Premier Aviation
22/10	ZT-WFD	DJI Phantom 4 Pro UAV Industries
23/10	ZT-WFG	DJI Inspire 1 Premier Aviation
24/10	ZT-WEZ	DJI Phantom 4 Pro DC Geomatics
25/10	ZT-WEC	DJI Phantom 4 Pro Salaria
25/10	ZT-WFH	DJI Matrice 210 Rocketmine
28/10	ZT-WFF	DJI Matrice 600 Pro LS Multi Copter Projects & Services
28/10	ZT-WFI	Tellumat Astus II UAV Industries
28/10	ZT-WFJ	DJI Matrice 210 Rocketmine

Total: 36

Cirrus SR22 T



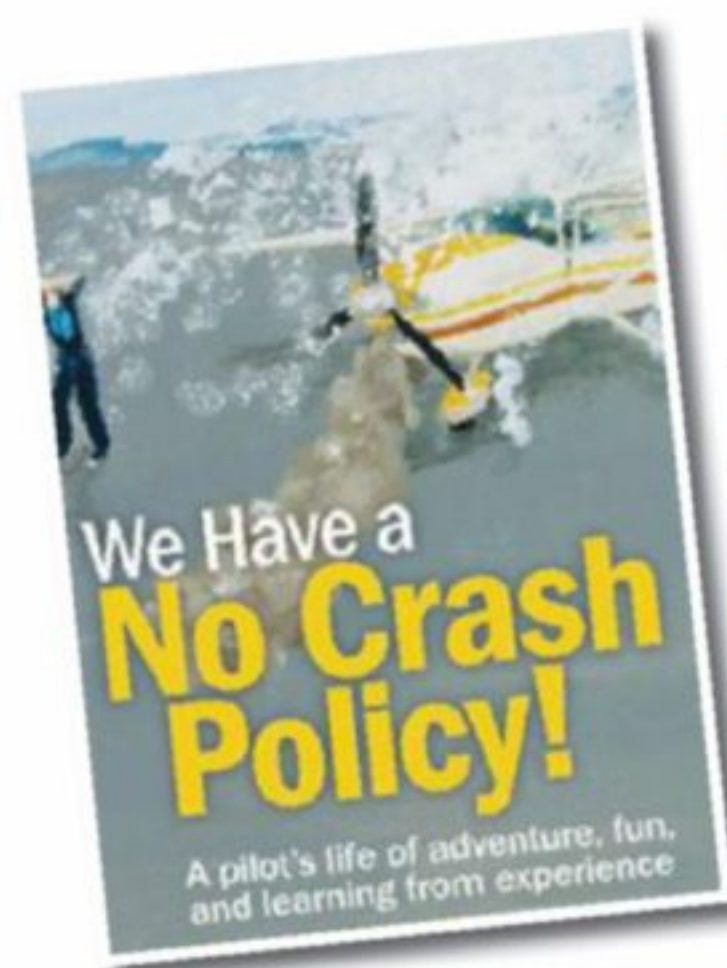
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Learjet 45

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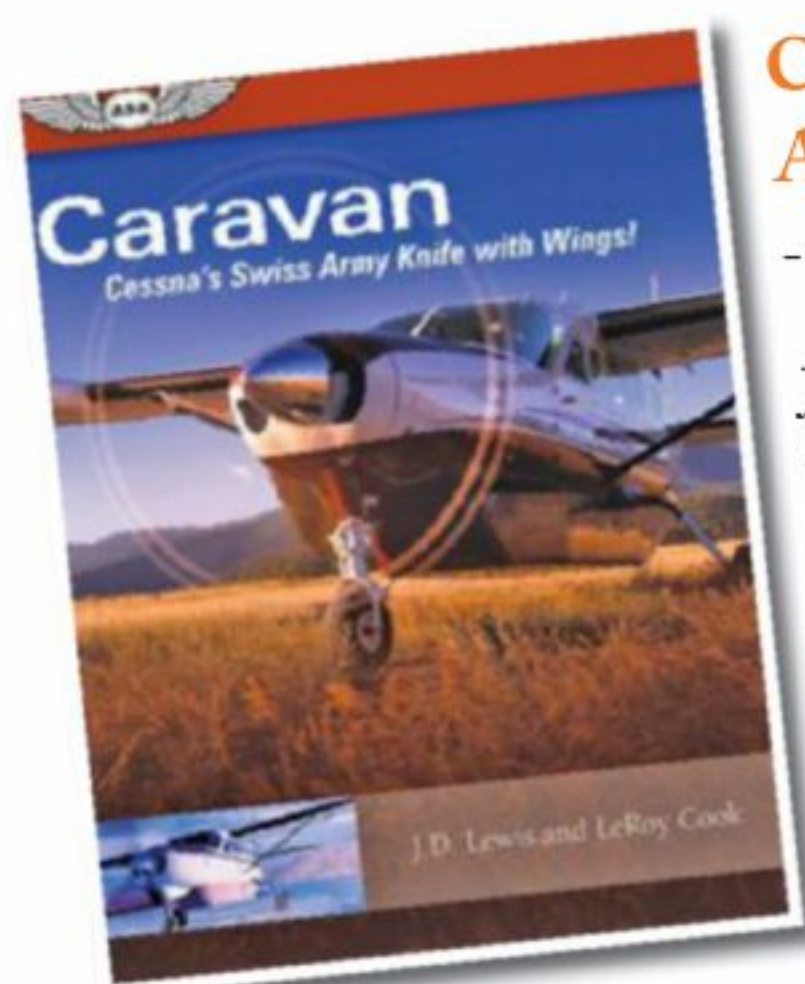
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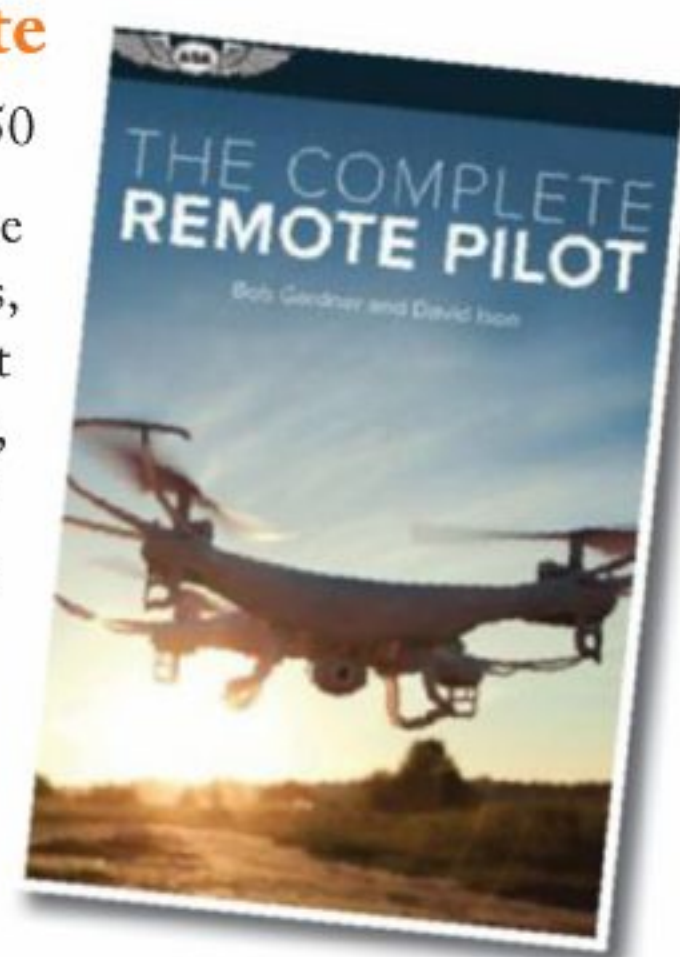
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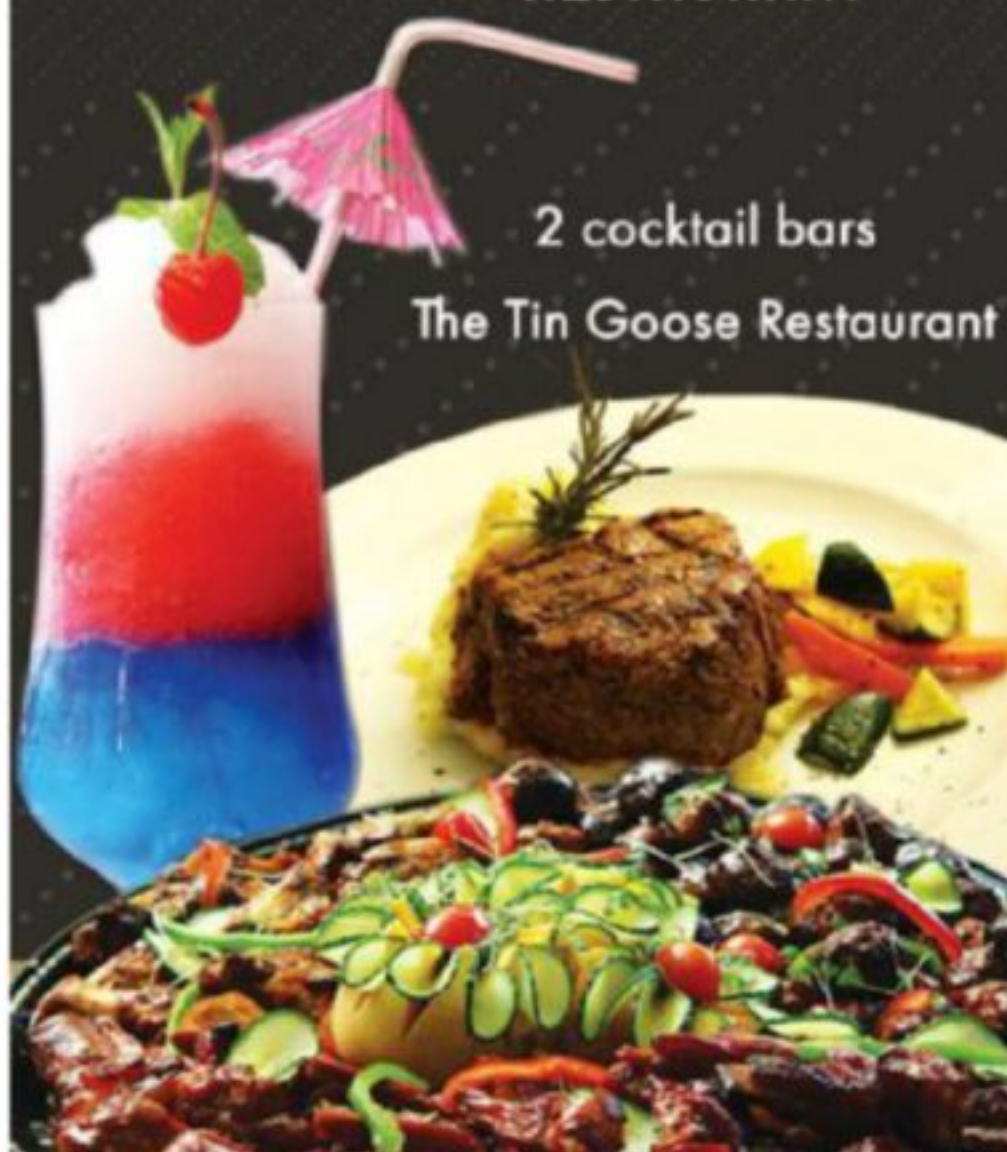
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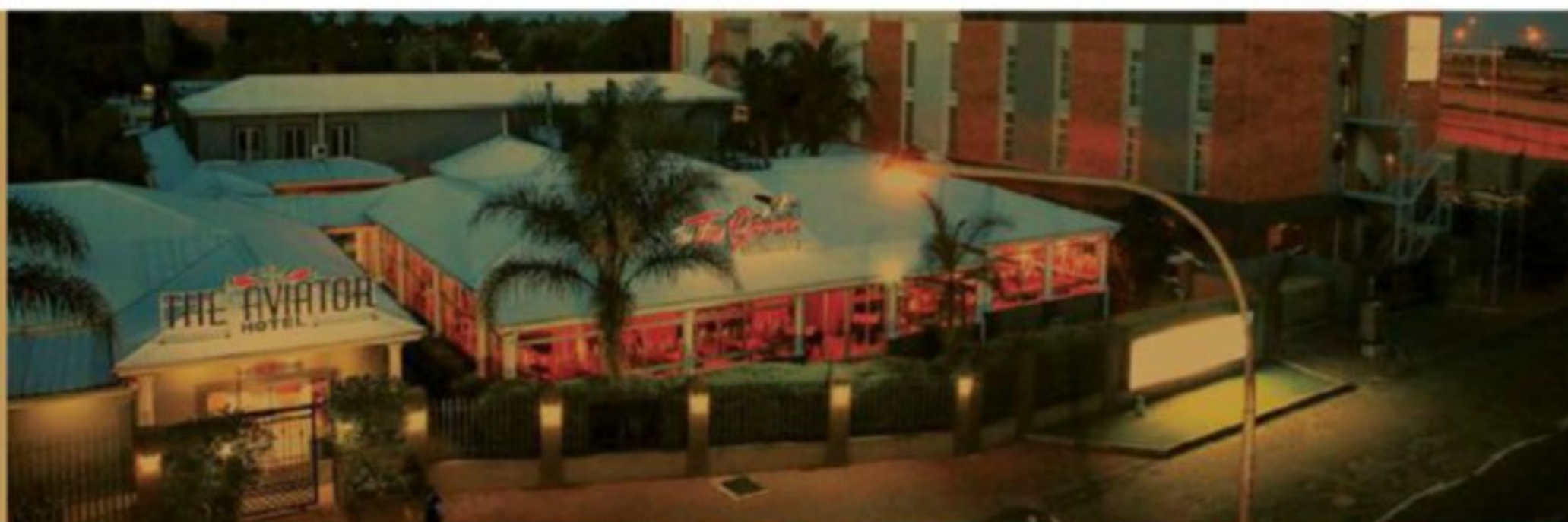
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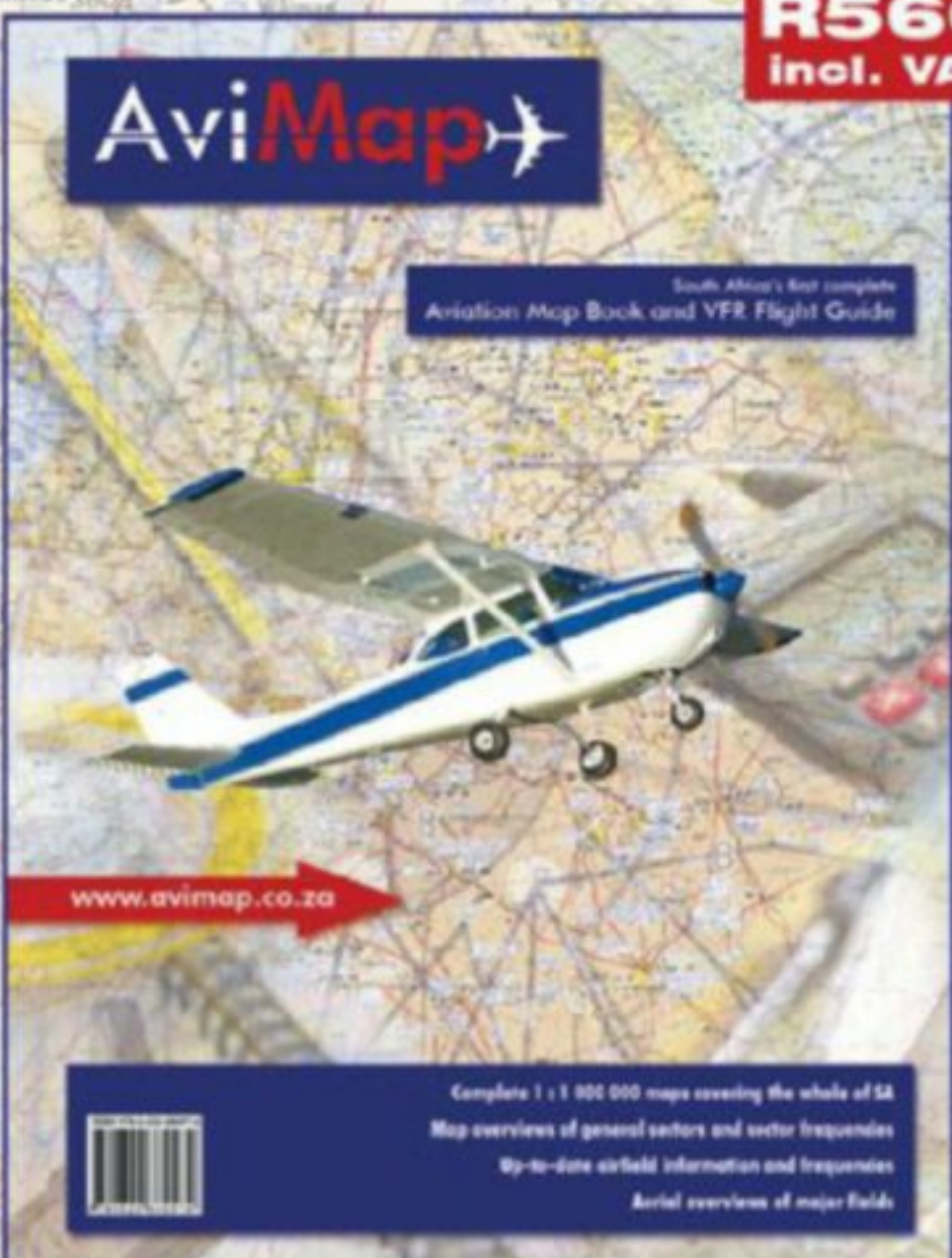
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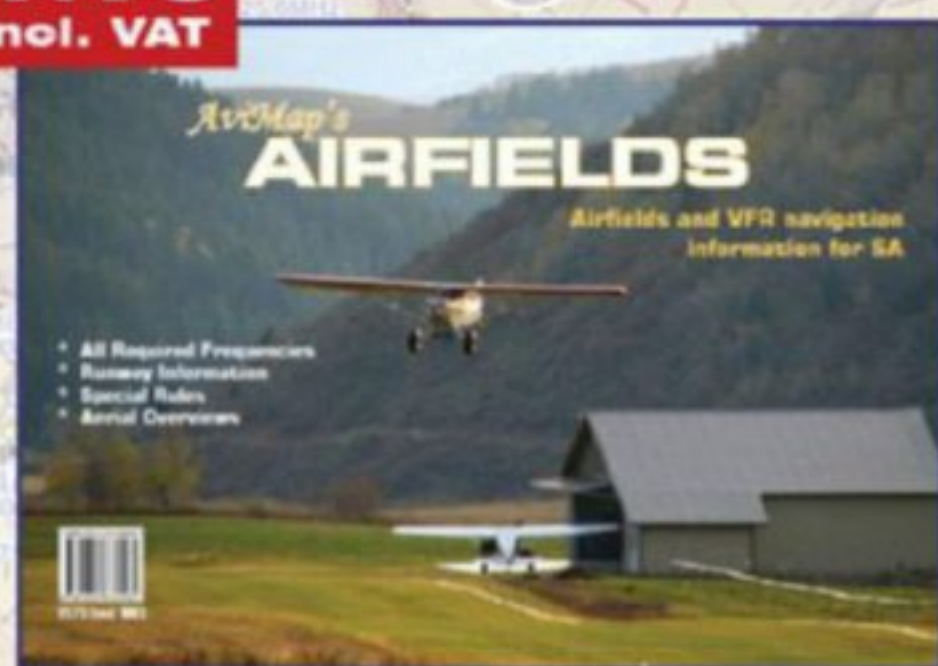


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