



AERONAUTICAL SOCIETY OF SOUTH AFRICA

(ASSOCIATION INCORPORATED UNDER SECTION 21)

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A DIVISION OF THE ROYAL AERONAUTICAL SOCIETY

AeSSA Newsletter – April 2013

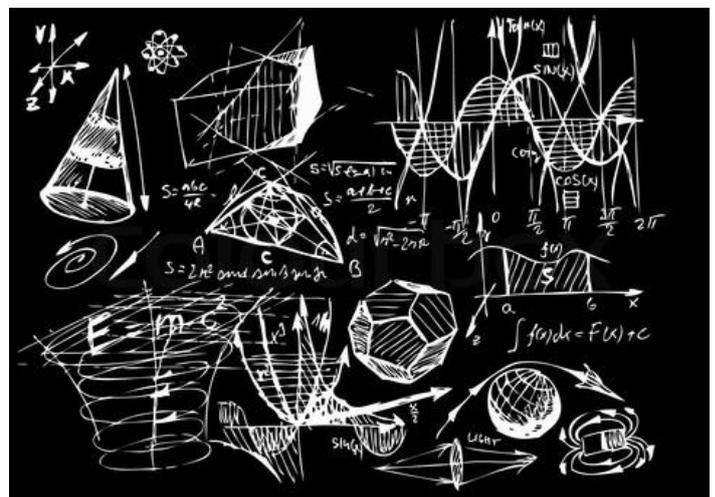
EDITORIAL – Filling the Aviation skills gap

Many workshops on skills have been talking point around the world in the recent months, with the premise of seeing an alarming growth in the 'skills gap' challenge now facing the aerospace sector (and other industries). Currently it is estimated that the average age of aerospace workers in the industry to be in the mid 50s. There is now a widening gap, say recruiters, between the kind of highly motivated, maths-savvy graduates they need, and the ones being produced – raising questions over the future competitiveness in our industry. With aerospace growth in the double digits, both the two big OEM's of Airbus and Boeing seeing demand in new airplanes outstripping production rates, the need for aerospace graduates is at an all time high, noting that the graduates that do become available to the industry is estimated to only fill half the need, and most do not have the skill sets to match the needs.

The problem then, is not only one of demographics and getting enough engineers to fill posts for an industry with massive growth projections, but of the right type of workers. Companies report that graduates are applying lacking not only in elementary maths or science subjects, but also lacking in 'interpersonal skills'. 'Text-speak' or the casual voice or email communication it seems has had an effect, with many being unable to craft a good standard of covering letter. This is not only true of those wishing to become engineers. Wannabee pilots, too, are 'failing the personality test', with some being found to have short attention spans and having an exaggerated sense of self-entitlement over the passion to fly.

The result is that either key jobs are going unfilled, or that companies are spending time and money re-educating young people by teaching them the basics. But this goes further down the educational chain. Universities, for example, argue the same thing, that the student's time in the first year, is spent teaching them the basics of science and maths, that they should already know.

What to do? So far the over-arching theme emerging from the workshops calls for an education system change – even down to the primary school level to boost maths and science subjects. Early deficiencies in maths, it seems are having cascading effects up the education ladder, with each level saying that time was wasted educating students (or recent graduates) on the basics. How to intervene effectively on this is a challenge of monumental proportions trying to steer the education system in a different direction and the time it takes for a change at basic education level to flow upwards through the system.



A South African Team wins a Silver Medal from the RAeS

By Rob Jonkers

Each year the Society promotes nominations for awards conferred at the Royal Aeronautical Society in London. We have had two recipients of these awards in the last 3 years, notably the Jonker sailplane project and Honorary Fellowship bestowed on Prof. Beric Skews. In 2012 from the three nominations offered, the awards committee decided to award the SAAB Camps team the Team Silver Medal for work contributing to major advances in aerospace.



With threats world-wide affecting civilian institutions and infrastructure, and with the ease of availability of man portable missiles, the possibility of shooting down civilian airliners has become a grim reality. With the

experience of the SAAB Grintek team in having developed many military missile avoidance systems, it made sense to look at adapting this for civil applications.

The technical challenge to achieve this revolved around the certification aspects with the civil certification authorities, as much of the work had to prove safety of operations at busy airports and air corridors. This meant the design of the crew interface had to be such that no direct control was necessary, and that the system needed to be operated autonomously. The type of flares that were allowed to be dispensed were limited to the pyro-phoric type, which at least covered the largest threat of 1st and 2nd generation man portable missiles, and at the same time had no civil application restrictions.

On the 6th of March, the Camps team led by Hannes Prinsloo provided a lecture at SAAB Grintek to Society membership, giving details of the design aspects and the challenges experienced to achieve their first civil certification. Currently the SAAB Grintek team are poised to break into the international market for installations of their system.



RAeS Team Silver Medal

Conferred for work contributing to major advances or contributions in aerospace.

CAMPS DEVELOPMENT PROJECT TEAM SAAB ELECTRONICS DEFENCE SYSTEMS

The team successfully conceptualised and integrated a system suitable for protection of civilian transport aircraft against shoulder-launched IR-guided anti-aircraft missiles. The system is named Civil Aircraft Missile Protection Systems (CAMPS).

The system makes available and affordable missile protection to transport aircraft, thus enabling essential humanitarian and other air operations in areas threatened by war and terror activities.

2012 Medals & Awards



Eskom Young Scientists Award

By Japie van Wyk

For 2012, the best Aeronautical Subject project award at the Eskom Young Scientists event was made to Phillippe Lothaller of Rondebosch High School in Cape Town. He received the Aeronautical award in the previous year as well for the same basic concept of spinning the wheels of an aircraft by scoops mounted on the wheels to reduce wear and damage to tyres during landing to reduce the costs and frequency of replacing the tyres.

He identified the main source of damage as being due to the large difference of the rotational speed of the wheels and the aircraft speed when landing resulting in large Stiction and Friction loads on the tyres.

His original approach was to use fixed scoops on the side faces of the landing wheels(for which he received the award in 2011). On a thorough questionnaire to aircraft operators he received much more advanced information related to his basic concept. This led him to develop a retractable scoop system which would not be a hindrance to the retraction of the wheels after take-off.



He also learned that it was unacceptable to retract high speed rotating wheels after take-off. The resulting innovative idea was the easily retractable scoop system whose operation was well and professionally implemented in his demonstration product reflected in the attached photo (with the scoops in the retracted condition).



Phillippe has also been chosen to represent South Africa at a very reputable International Science Expo in Phoenix, Arizona in May 2013. He is currently busy with an improvement concept and has plans to find the means to build firstly a wind tunnel model and then a flyable prototype. He has been supported by the engineering department at the University of Cape Town.

University of Pretoria Aeronautical Society – 2012 in review

By D Toma – Chairperson – edited from the original report

The University of Pretoria student branch of the Aeronautical Society of South Africa was formed to fulfil the needs for such an establishment at the University, and consist of an impressive 500 members, making the logistics of attending events somewhat daunting.



UP Aeronautical Society

Some of the activities undertaken in 2012 were:

- Carrying out a student based community project at the Zwartkop Air Force base museum, where 58 students took part in raising funds to the value of R 50 000 for the museum.
- Attended the Air Power Capability display where 60 students went to the Roodewal Live Firing Range
- Attended the SAAF Museum Warbirds Centenary Air Show to help the museum sell beverages to the public to raise funds.
- In preparation for the upcoming RC model competition the society organised a training session in order to help its members get started with the building of their aircraft.
- In preparation for the upcoming second visit to the live fire range the society had Col. Rama Iyer from the South African Air Force give the members a presentation about



Air Power capability in general. This proved to be a great eye opener for all who attended as air power isn't as simple as one thinks.

- A flight for 26 members in a vintage Douglas DC-3 was undertaken. The flight took the members all over JHB CBD, Sandton City as well as many prominent South African landmarks.



Planning is underway for 2013 activities, with the possibility of expanding membership to other engineering disciplines. Industry visits will be on the calendar as well as supporting the SAAF museum. An increase in lectures are also on the cards.

The Society is also continuously on the lookout for sponsorships to assist in funding transport costs and team activities, any donations will be appreciated.



Intersarsity Model Aircraft Competition - 2012

The third annual inter-varsity flight competition took place on the 27 October 2012 at the Swartkops Air Force Base. The University of Pretoria, the University of Witwatersrand, and the University of the North West competed in this spectacular competition where Aeronautical Engineering students from all three Universities built their own radio controlled model aircraft.

The Universities competed for an overall trophy sponsored by the Aeronautical Society of South Africa.



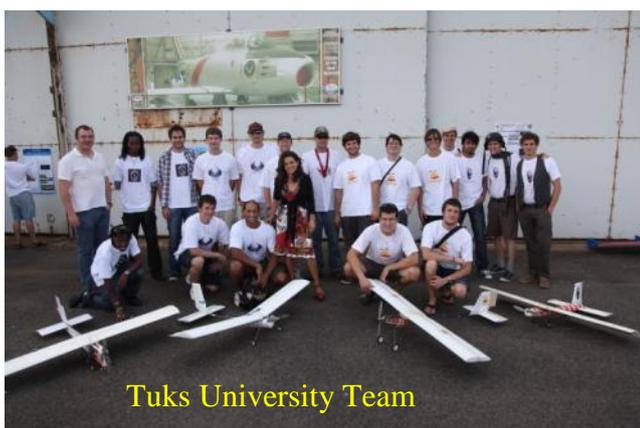
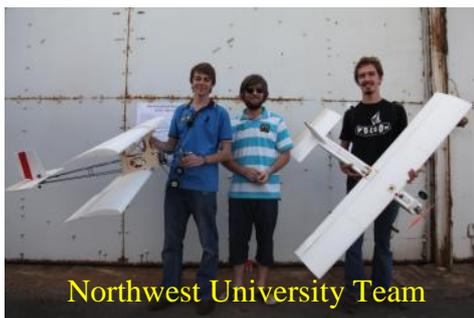
The challenge was to conceptualize, design and build a radio controlled model aircraft that could take-off in as short a distance as possible. The aircraft was then required to fly as slowly as possible over a short course while carrying a full 340ml drinks can as its payload. The combined scores for the concept design, analysis of the take-off and flight performance determined the winning team.

For this year the format changed slightly with the presentations not

being required, but rather a panel of judges reviewed each of the designs based on posters that were made to define their concept. As the Saturday afternoon unfolded, stormy weather came rolling in with adverse wind conditions, which had half the field having to return on Sunday morning to complete the challenge. The winning team was from the Northwest University and the University that won the University prize was the University of Pretoria.



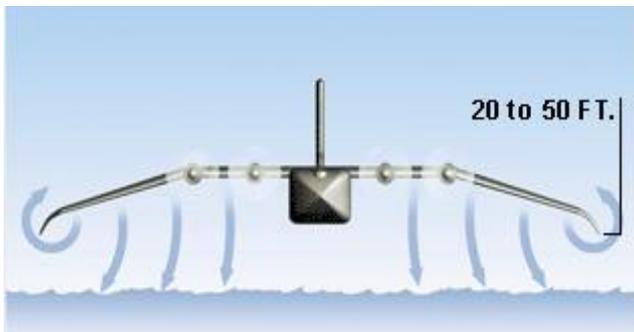
The next challenge will be held in October 2013 which will take on a different challenge format, one that will have designs that should at least have better capability in windy conditions. See you there.



Wing In Ground Effect & NE Rowe lecture

Lecture by Prof. Laurent Dala

From an Old Aircraft to a New Concept, the Waterborne Ground Effect Aircraft was the topic of the lecture provided by Professor Laurent Dala, Head of Aeronautical Engineering, University of Witwatersrand given on the 6th March at the UP auditorium.



With rising costs of fuel and growing concerns over the environment, alternative forms of transport and the quest for greater efficiency are becoming more and more prolific. The potential benefits of some more exotic transport solutions bear significance at being explored.

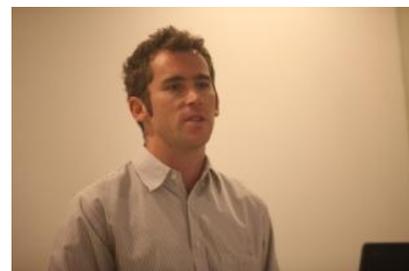
The prime reason that Wing In Ground Effect craft have retained a research and support base is their perceived ability to provide heavy lift with greater efficiency than aircraft and at higher speeds than ships.

Their performance aspects are cited as their greatest advantage with the ability to transport heavy loads more efficiently than aircraft and more quickly than ships. Operationally, there are advantages in operating from water or in amphibious mode, rather than requiring fixed runways.

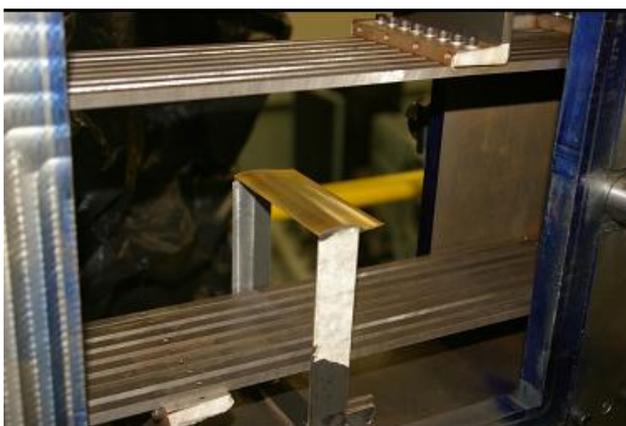
Royal Aeronautical Society Young Persons Candidate Award NE Rowe Lecture

The Design, Construction and Calibration of a Transonic Wind Tunnel
By Jonathan Nash, *Best Student Presentation at IASSA 2011*

Jonathan Nash designed and constructed a new facility for the School of Mechanical, Industrial and Aeronautical Engineering at the University of the Witwatersrand. The facility is used for demonstrating and studying transonic flow phenomena. The facility is the longest of its kind and is thought to provide the longest duration testing time for a facility of this nature.



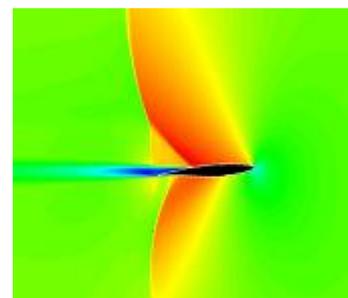
The cost of manufacture of the facility was low, while the quality of the results it produces is high. The facility is able to be modified at low cost in order to study different geometries and layouts. The facility has already proved to be an invaluable research tool since its construction, being used for research in the Flow Research Department at the University.



It is envisaged that the work done is potentially useable at other flow research facilities as an enhanced capability.

This topic was submitted as a paper for consideration towards the RAeS NE Rowe Young Persons Award for 2013.

We wish Jonathan the best of luck.



Airbus - Fly Your Ideas Competition

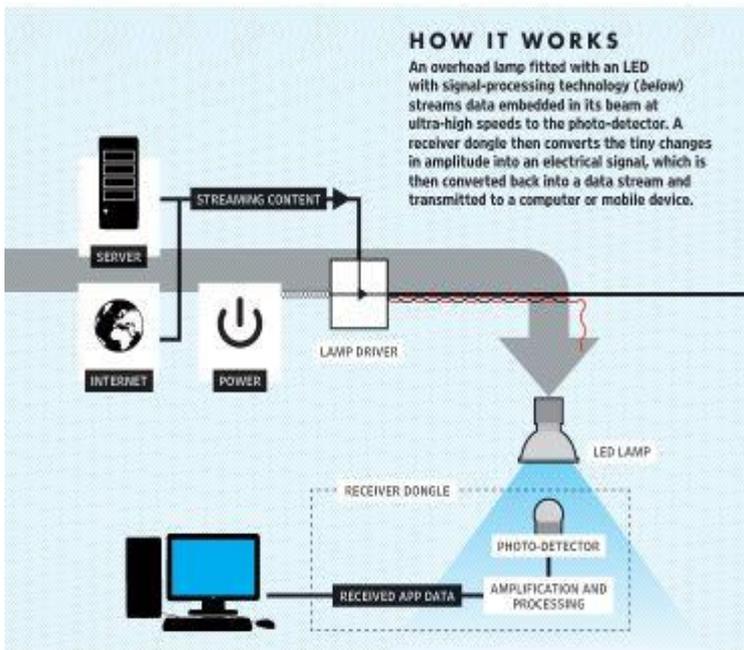
As one of the world's leading aircraft manufacturers, Airbus is looking ahead to anticipate the global needs of a more connected, more sustainable world. Airbus Fly Your Ideas challenges students across the globe to develop new ideas for the eco-efficient aviation industry of the future.

The competition is open to teams of three to five students from around the world, currently studying a Bachelors degree, Masters or PhD in any academic discipline, from engineering to marketing, business to science and philosophy to design. The winners of Fly Your Ideas 2013 will share the top prize of €30,000: the runners up €15,000.



WHAT IS LI-FI?

Li-Fi is a term often used to describe Visible Light Communications technology applied to high speed wireless communications. Which we are using to Fly-y-Light!!



One of the teams entered is from the University of Witwatersrand, and who have got through the 2nd round. They are known as the Storm Hawks with team members Pitso Mangoro, Muhammed Dangor, Tshireletso Mango, Sambharthan Cooppan and Azhar Cassim. Their mentor is Prof Laurent Dala.

Their project idea encompasses a "Fly by Wireless" Concept. The Society is in part providing sponsorship for this team, and we wish them success to reach the winner's podium in June 2013.

THINKING OUT-SIDE THE BOX

We can use these LEDs in the cabin to transmit data for flight controls.



THE REAL FLY BY WIRELESS

Visible Light communication flight control is a system that aims to improve the current fly-by-wire system - A team of students from South Africa are the first to coin such system

Pierre van Ryneveld – a glimpse of his life in South Africa (a patron of the AeSSA)

General Sir H. A. ("Pierre") van Ryneveld, KBE, CB, DSO, and MC established the South African Air Force in 1920.

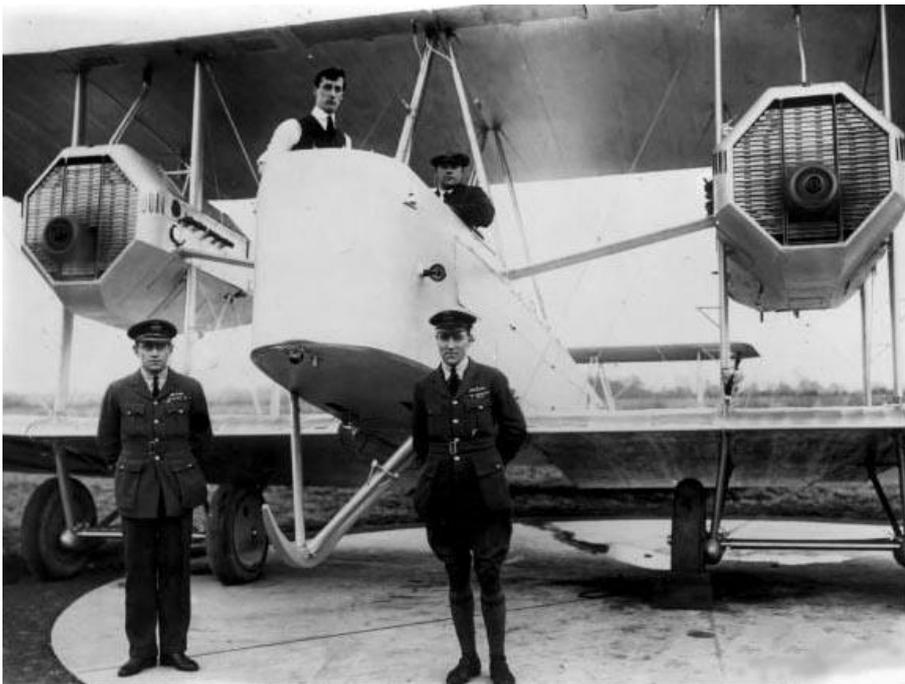
Van Ryneveld was born on 2 May 1891 at Senekal in the Free State. He matriculated at Grey College School in Bloemfontein and was also trained as engineer in London where he entered a British regiment in August 1914 to be trained as a pilot. In July 1915 he joined the Royal Flying Corps (forerunner of the RAF), and served in WWI as a war pilot and commanding officer in the mid-East and France.



In 1919 General Jan Smuts recalled him from Cologne where he served as squadron commander. General Smuts, Prime Minister of the former Union of South Africa, decided that South Africa must establish its own air force, and for this purpose Colonel van Ryneveld (27 years old) was selected. With effect from 1 February 1920, van Ryneveld was appointed as Director of Air Services, and was instructed to form an air arm that would be part of the army. He fought this idea and won, and consequently the South African Air Force - SAAF was formed as an independent unit of the army. In June 1920 the first recruit was sworn in.

General Smuts wanted South African aviators to be the first to complete the trip from London to South Africa. He authorised the purchase of a Vickers Vimy at a cost of £4 500. It was named the Silver Queen, and commanded by Lt Col van Ryneveld with First Lt Quinton Brand as the co-pilot. They took off from Brooklands (England) on 4 February 1920. After an exciting night crossing of the Mediterranean Sea, they arrived at Derna the next morning. More night flying following in a challenge to catch the Vickers Vimy sponsored by the London Times. The Silver Queen was however wrecked during a force landing at Korosko in Sudan.

A second Vimy F8615 was purchased from the RAF at Heliopolis. The original engines were installed into it, and The Silver Queen II left from Cairo on 22 February. Five days later the London Times challenger was destroyed in a crash at Tabora. The same bad luck happened to the Silver Queen II at Bulawayo (in Zimbabwe) on 6 March.



(L-R) Lt Col van Ryneveld with First Lt Quinton Brand, February 1920, standing in front of Vickers Vimy, G-UABA, the "Silver Queen", before setting out on a England to South Africa Flight

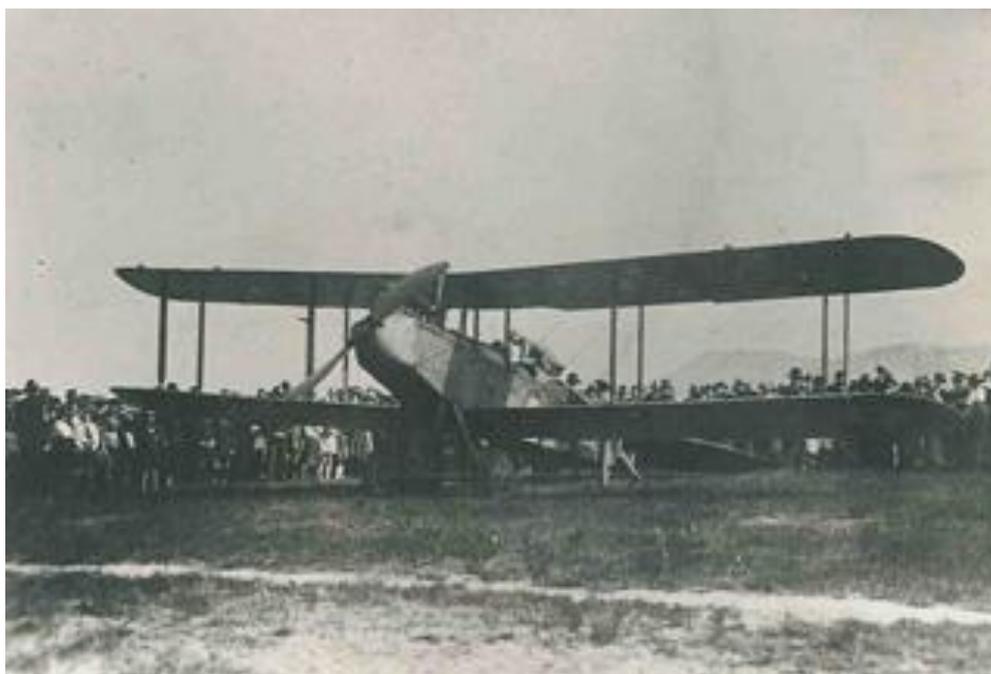
Fortunately, with some of the "Imperial Gift" aircraft already in Pretoria, a DH9 H5646 called Voortrekker was put together, and dispatched post haste to Bulawayo. Van Ryneveld and Brand were therefore able to complete their flight to Cape Town where they arrived at Young's Field on 20 March 1920 after a total flying time of 109 hours and 30 minutes.

Following an extremely generous decision by the Imperial government in 1919 to allocate to the Union from its war stocks, a donation of 100 surplus military aircraft, (48 De Havilland DH9s, 30 Avro 504Ks and 22 SE 5a scouts), complete with spares and maintenance equipment, which became known as the Imperial gift, got the SAAF off to a flying start. In 1921 the SAAF bought a site east of Roberts Height (later Voortrekkerhoogte and now Thaba Tshwane), near Pretoria. Here the first aerodrome for the SAAF was established and was named Zwartkops.

In 1929 Van Ryneveld became the officer commanding at Robert's Heights (Thaba Tshwane) and Commandant of the S.A. Military College, but remained Director of Air Services. The post of DAS was abolished on 30 April 1933 and on the following day Col Pierre van Ryneveld was promoted to Brigadier-General and appointed Chief of the General Staff. There was thus no chief of the SAAF and it remained under Van Ryneveld's direct control until 30 June 1939.

South Africa's military aimed at greater things, and in September 1939 the Chief of Staff, van Ryneveld, proposed the formation of a Mobile Field Force. It was intended to be made up of two infantry divisions (each of three infantry brigades), a mounted brigade and an armoured regiment. Together with supporting artillery and coastal defence forces, 140,000 men would be required. Even though it was not formally accepted, the proposal set the prototype for a later mobilisation and force structure. In October 1939, van Ryneveld, as Chief of the General Staff, approved a plan known as the Peace Expansion Scheme, under which a total of 720 aircraft were acquired - 336 of which were fighters. When Italy entered the war in 1940, South African squadrons were sent to East Africa, later to be supplemented by more modern aircraft. The SAAF played a remarkable role in the victory over Mussolini's African Empire.

Van Ryneveld retired on 2 May 1949. The distinguished and highly decorated SAAF pilot died in Pretoria on 2 December 1972.



The De Havilland DH9, christened Voortrekker, in which Sir Pierre van Ryneveld and Sir Quintin Brand completed their epic flight

FORTHCOMING EVENTS

The Intervarsity model Aircraft Challenge to be held at AFB Swartkops on Sunday the 20th October 2013.

Join in an afternoon of fun while students try out their hard thought out designs to fly a 4 leg pylon race, its all about design efficiency and the optimum configuration.



Des Barker will provide a talk on Air Show Safety. Also planned are the following, dates & times to be advised:

- Oryx – Project Drummer flight testing
- AGM, end of May, venue & topic to be advised



Planning for IASSA 2013 has now started, details to be found on the website www.iassa.org.za . Registrations will also start shortly, please advertise to colleagues and acquaintances.

IASSA 2013 will take place at the Lord Charles, Somerset West, on 2 & 3 September 2013, and will take place in conjunction with the ICAS (International Council for Aeronautical Sciences) Planning Committee meeting and workshops.

