



Flying Spirit

April 2021

President's Message



Col Mike Louw (Ret)

On this day exactly a year ago (26 March 2020), South Africa was gearing up to enter a hard lockdown to thwart the threats posed by the dreaded Covid-19 pandemic.

Much has transpired since then and our resilience has been tested to the limits. Conspiracy theories abounded and many people, particularly the vulnerable and aged, felt threatened, not knowing what the future held in store for them. Sadly, since then several persons within our own family, friendship, and social circles, as well as within organisations and associations to which we are affiliated, succumbed to the dreaded disease. On the positive side, many more persons within these groupings survived to live another day and to share their experiences with us. For this we are grateful. Although the end is not yet in sight, much progress has been made over the last year and hopefully, the promised vaccines will soon reach the most vulnerable within our society. However, life continues, and we must all ensure that we continue to play the game in terms of the rules of engagement to mitigate the risk factor as much as we possibly can.

Just over a week ago, we learned with shock of the tragic passing away of two esteemed

members of our Association, Maj Gen Des Barker (Ret) and Col Rama Iyer (Ret). On behalf of SAAFA, I extend our heartfelt condolences and sympathy to both families and pray that they will be comforted and strengthened during this time of grief and bereavement. It is ironic that both individuals met their untimely end whilst engaging in activities aimed at the preservation of our collective aviation heritage through their active and continued participation at the SAAF Museum. Although their passing has left a huge void, their legacies and deeds will live on forever.

They have slipped the surly bonds of Earth.

They shall mount up with wings as an eagle,

put out a hand and touch the face of God.

At the going down of the sun and in the morning,

We will remember them.

Congress 2021 is just around the corner and our Durban Branch is pulling out all stops to ensure the success thereof. The venue is in the picturesque KZN Midlands at the

St Ives Lodge and Venue near Howick. Details regarding the programme and registration have already been circulated and for planning purposes, we request that all those intending to attend advise our Congress Coordinator, Hugh Paine (Cell: 082 735 1683 Fax: 086 683 1900 e-mail: htpaine@gmail.com) of the numbers accordingly as soon as possible, but in any event by no later than 7 April 2021. Besides the business of our Annual General Meeting, Congress is also an opportunity for us to give public recognition to those among us who have gone beyond the call of duty in serving the needs of others through their active participation in the activities of our Association at various levels. Without such member participation and contributions, we would cease to exemplify the spirit for which we are so well known.

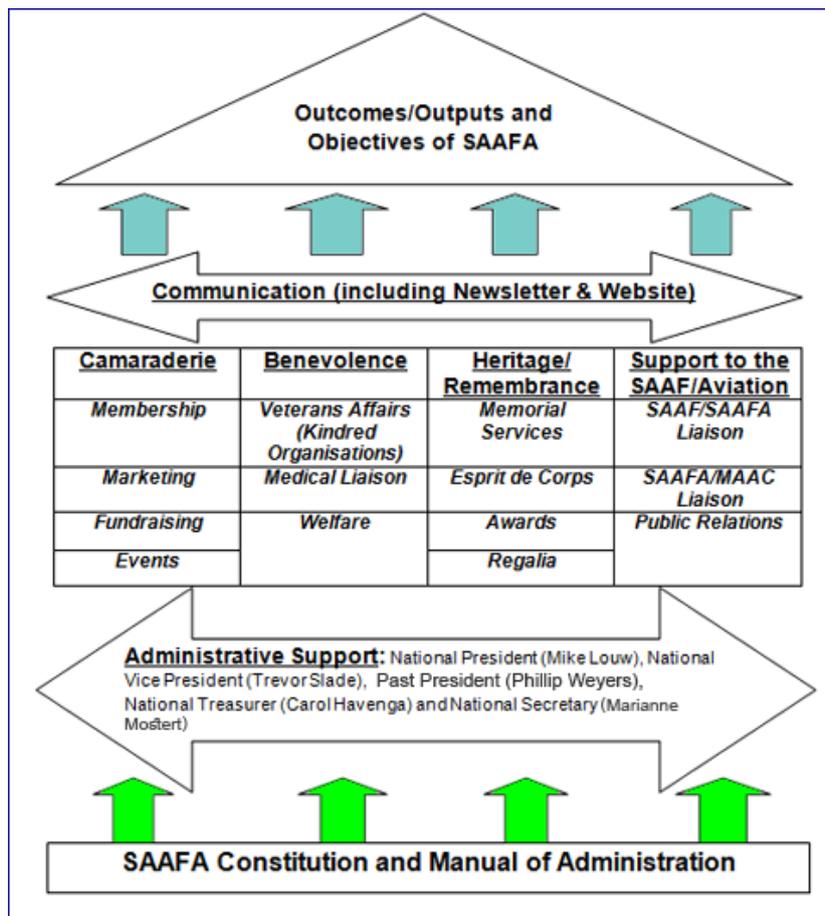
Despite the current restrictions placed upon our lives by the current pandemic, I trust that SAAFA will remain an integral part of your lives and from which you derive much enjoyment, along with the satisfaction and pride which comes from being of service to your fellow man.

Let us then continue to truly live out the values of our Association in being a source of comfort and strength to those most vulnerable among us, and to continue to maintain and foster friendship, comradeship, and good fellowship among all members. Let us continue to bear one another's burdens during the challenging and unknown times that still lie ahead.

God bless.

Mike Louw

National President: South African Air Force Association



MILITARY ATTACHÉ AND ADVISOR CORPS'



MAAC

With the relaxation of Covid regulations, certain of the Embassies have slowly begun emerging from hibernation and started reintroducing some selected celebration, social and interaction functions. These are all done in strict compliance with the requirements necessitated by Tannie Rona and are an extremely welcome return to limited activity.

The Ambassador of the Republic of China (Taiwan), HE Anthony Chung-Yi Ho, invited the SAAFA Foreign Relations Representative (ForRelRep) to join him for a lunch to discuss matters in general and enjoy some light relief. Taiwan had just days before appointed a new Minister of Defence, General Chiu Kuo-Cheng, and a letter was directed on behalf of SAAFA congratulating him on his appointment. Gen Chiu had previously served as Intelligence Chief as well as CGS, but of particular interest is that he spent a year in South Africa in 1988/9 attending the Joint Senior Staff Course. By all accounts South Africa remains close to the General's heart. Our Taiwanese friends remain gracious and kind, and as noted previously SAAFA has even an Honorary Member in Taiwan, Col Jeff Lin, who is doubtless fondly remembered by many of us.



HE Ambassador Ho, Secretary Tim Wen, Col Thomas Chih-Tang Liu, SAAFA ForRelRep

SAAFA National President, Mike Louw, and the SAAFA ForRelRep were graciously invited by the Korean DA, Col Byungchul Lee to lunch at his residence. The menu was Korean and as with all excellently prepared Korean cuisine, in this case by Mrs EuRa Lee, absolutely excellent. The Kimchi was particularly good! There is no doubt about the wonderful relationship that continues

with the Korean Embassy, due in no small part to the extraordinary efforts of the President of SAKWVA, Col Dirk Louw.

The DA from the Kingdom of Thailand, Col Suthep Khiewpakdee, hosted a joint Armed Forces Day and farewell function and invited the SAAFA National President and the SAAFA Foreign Relations Rep to attend, with the ForRelRep given the honour of delivering the keynote address. It was an extremely enjoyable function with again extremely gracious hosts. Col Khiewpakdee has been an extremely competent and successful Military Diplomat for the Kingdom of Thailand, a good friend, and a wonderful personality in the MAAC community, we wish him well, he will certainly be missed.



Mike Louw and SAAFA ForRelRep with Thai Minister Boonparlit, Col Khiewpakdee and their gorgeous wives.

Our friends at the Defence Section of the U S Embassy have also emerged from enforced hibernation and the DA, Capt Dereck Brown USN, and his splendid team hosted the return of a firm favourite on the MAAC calendar, the US DAO "Happy Hour". This function is geared simply to enjoy one another's company while being treated to fine G & T's, or whatever your favoured refreshment might be and an excellent finger supper. Always a fine event, this one was even better due to their having been such a long period of abstinence. Capt Brown assumed responsibilities after the departure of Capt Steve Morgenfeld USN who has taken up duties in Chile and is a delightful gentleman who will doubtless be an integral member of the MAAC community, we welcome him to South Africa and will be invited to take up Honorary SAAFA membership.

MAAC



- ▶ Several of our members have passed away due to COVID-19 during the period under review. Two of the members were Michiel De Kok and Johnny De Villiers We also received notice of the passing of Bob Gillett.
- ▶ No fundraising has occurred, other than some financial contributions to our Centurion fund. Our golf day has been put on hold until later in the year.
- ▶ The Branch does send copies of our newsletter to kindred organisations e.g. Korean War Vets, Moths and SA Legion.
- ▶ One of our golden oldies Denbigh Bennett who is 93 years old suffered a stroke just after Christmas and has had to be moved to a frail care centre after still living alone in her own house.
- ▶ Have received some pictures of construction vehicles working around the Memorial Wall and the Museum, it seems like the long-awaited refurbishment of the area is finally happening.
- ▶ Planning underway for our AGM and monthly lunch to be at the Goodwood Club, with necessary COVID-19 protocols being adhered to.

SAAFA



- ▶ Bill Williams joined in the month of February 2021, and Nick Lithgow was transferred back to the "Active List" after an absence of some two years.
- ▶ I managed to get an article regarding the SAAFA Durban Branch published in the local community newspapers (South Coast Sun and South Land Sun newspapers). The article included a bit on me, as the Chairman since I live in Amanzimtoti and that was a prerequisite for the article, and I received two enquiries from people who are possibly interested in joining the SAAFA. The article was published on the front page of the newspaper.
- ▶ No Branch lunch was held in February 2021, but the intention is to hold the SAAFA Durban Branch AGM at the Durban Club on 26 March 2021.

SAAFA



- ▶ We have 76 active members at present.
- ▶ I am happy to report that despite an invitation to them to make use of the Outeniqua committee should the need arise, no one has made use of our invitation.

SAAFA



- ▶ The Branch AGM is planned for late March or early April should the risk drop to an acceptable level.
- ▶ The AGM will be held at a suitable venue where the necessary precautions can be in place. Should the risk be assessed as being too high; a virtual AGM will be held using the Zoom platform.
- ▶ Lorna Els is preparing to depart Port Alfred after many years to live with her son in Port Elizabeth.
- ▶ Two new members, Dudley Foote and Eric Fisher joined the Branch in February 2021.

SAAFA



- ▶ There was a Virtual Zoom Meeting held on 16 February 2021.
- ▶ The committee will more than likely be in a position to have the BEC meeting at the Pretoria SAAFA Offices as from April 2020,
- ▶ The Branch is expecting 3 transfers to the Pretoria Branch.
- ▶ There were still a few contributions for the Lunches for Love initiative during February which is sincerely appreciated.
- ▶ The Pretoria Branch Executive Committee will therefore remain the same for the 2021/22 period and we look forward to continuing to serve our members for the next year.

SAAFA



- ▶ The Pietermaritzburg Branch did not hold a lunch in the month of February 2021.
- ▶ Morgan Holmes had a heart valve (supplied by a pig) replaced on 19 February 2021 but has recovered fully and is extremely well. Morgan says that when he saw the price of the heart valve (R480 000) he thought that they could at least have given him the rest of the pig as well. However, it may not be ethical to place the donor of your heart valve on a spit braai.

SAAFA



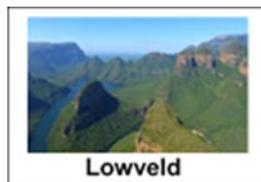
- ▶ One new member was welcomed in February. Marietjie Viljoen is an ex-Denel employee who live in Benoni.
- ▶ There is hope that the lunch routine will be resumed soon. A special brunch was arranged for long-standing members Carel and Catrien Olivier at a garden venue recently.
- ▶ A newsletter has been prepared by Roelf Rossouw for imminent distribution.
- ▶ First meeting for the new year will be the AGM. A post-meeting barbeque will follow this meeting with due regard for Covid protocol. All attendees will have plenty of space to ensure proper social distancing and certain shy members can easily conceal their vulnerable bodies amongst the abundant shrubs.

SAAFA



- ▶ There was a positive response to the invoices which included the new Membership Levy of R200.
- ▶ The chairman attended the SS Mendi Memorial Service In Soweto and laid a Wreath on behalf of the SAAFA.
- ▶ Three new applications for membership have been received. The branch AGM will be held on Friday 26 March 2021. Carl Bollweg has been co-opted to the Branch Committee and his position will be ratified by the AGM.

SAAFA



- ▶ The Lowveld SAAFA branch did not have any meetings in the last few months due to Mil activities and Covid 19 that forced us to postponed the meeting till the end of April 2021.
- ▶ The first SAAFA meeting will be held on 30 April 2021 and the AAC AGM will be on the 16 April 2021.
- ▶ The SAAFA Laeveld Branch are requesting assistance regarding banners and teardrop flags with our own Branch name on them. We do not have the funds to print our own teardrop flags at this stage, any help will be appreciated.

SAAFA



- ▶ We also extend a hearty welcome one new member who registered during the reporting period i.e. Sharon Geyer.

- ▶ It is with great sadness that we were informed of the passing of one of our close friends, Michael Welchman, who answered the Sunset Call on 05 February 2021.
- ▶ Assistance was provided in respect of payment advice on hospitalisation at Hermanus Provincial Hospital for an emergency procedure and with RFMCF and GEPF procedures to register a member's passing away.
- ▶ The newsletter is due towards end on March, after the AGM and luncheon scheduled for 17 March 2021.
- ▶ A BEC Meeting was held on 24 February 2021 (10h00). The Branch AGM and luncheon is scheduled for 17 March 2021.
- ▶ The current Branch Information Brochure is in process of revision and updating of relevant information that could be beneficial to branch members, and to new members in particular.

SAAFA



- ▶ Freda Garzouzie's husband, John, is receiving dialysis and is at home with the family.
- ▶ We are trying to get the committee together for a meeting during March.

SAAFA



- ▶ Severe restrictions in the Braambos area made it impossible for any SAAFA activities.
- ▶ Only one meeting was held during the last three months with 7 people attending.
- ▶ All activities in the new year will be planned in or around private venues.
- ▶ Working together with the Turbi Hills MOTH Shellhole will be pursued.
- ▶ The branch has 5 permanent members and a possible 10 more members that could join the branch this year.

SAAFA



SAAFA



SAAFA CONGRESS 2021 AND 76th ANNUAL GENERAL MEETING



The SAAFA Durban Branch is proud and excited to host the SAAFA Congress and 76th Annual General Meeting from 18 to 21 May 2021 at the St Ives Conference Centre in the Midlands in KZN.



ACCOMMODATION (LIVING-IN) St Ives

Delegate	R 3100
Non-delegate	R 2530
Spouses' excursion	R 250

(Costs includes 3 evening functions, Wednesday lunch and Congress tea/coffee.)

ACCOMMODATION (LIVING-OUT)

Delegate	R 1360
Non-delegate	R 730
Spouses' excursion	R 250

(Costs includes 3 evening functions, Wednesday lunch and Congress tea/coffee.)

Congress Coordinator:	Hugh Paine
Cell:	082 735 1683
Fax:	086 683 1900
e-mail:	htpaine@gmail.com



SOUTH AFRICAN AIR FORCE ASSOCIATION



76TH CONGRESS ST IVES, KZN MIDLANDS 18 - 21 MAY 2021



TIME	FUNCTION	VENUE	DRESS	ATTENDING
Tuesday 18 May				
15h00 – 17h00	Registration	Reception	Casual	
17h00 - Late	Meet & Greet followed by dinner	Restaurant/ balcony	Casual	All
18h00 – 19h00	National President Interaction Meeting	Breakaway room	Casual	National President and Chairmen
Wednesday 19 May				
07h00 – 08h00	Breakfast	Restaurant	SAAFA Uniform	Living in Members
08h30	Welcome, Act of Homage & Congress Opening Ceremony	Chapel	SAAFA Uniform + medals (full size)	All
09h45	Group Photo	Entrance steps	SAAFA Uniform	Delegates
10h00	Tea and refreshments	Balcony	Smart Casual	All
10h30	1 st Business Session		Smart Casual	Conference delegates
10h30 -	Spouses Excursion	<i>Midlands Meander</i>	Comfortable	Spouses
13h00 – 13h45	Lunch	Restaurant	Smart Casual	Conference delegates
13h45	2 nd Business Session	Conference room	Smart Casual	Delegates
15h15	Tea	Balcony		
15h30 – 17h00	3 rd Business Session	Conference room	Smart casual	Delegates
18h00 -	Socialising and dinner	Boma restaurant	Casual	All
Thursday 20 May				
07h00 – 08h00	Breakfast	Restaurant	Smart Casual	Living in Members
08h30	4 th Business Session		Smart Casual	Conferees
10h00	Spouses depart on excursion	Midlands Meander	Comfortable	Ladies
10h00	Tea			
10h30	5 th Business Session	Conference room	Smart Casual	Delegates
13h00	Lunch	Piggly Wiggly Restaurant	Casual	All
17h00 -	Socialising			
18h30	Banquet reception	Reception	Formal/ Dark Suits & Miniature Medals	All
19h00 - 23h00	Banquet, Awards and Official Closure	Banquet room	Formal/ Dark Suits & Miniature Medals	All
Friday 21 May				
07h00 – 08h30	Breakfast	Restaurant	Casual	Living in Members
	Depart for home			All

SAAFA

The Joint Air Training Scheme



South African memorial to Royal Air Force personnel who died during the Joint Air Training Scheme.



Despite the pre-war South African Air Force (SAAF) expansion plans, the start of the second World War in 1939 caught the SAAF unprepared.

The British Air Council approved a scheme on 23 October 1938, to locate flying training schools overseas. In September 1939, South Africa was invited to join talks being held at this time in Canada and which were to outline the scheme.

The British Commonwealth Air Training Plan, also known as the Empire Air Training Scheme, Empire Air Training Plan, Joint Air Training Scheme (JATS), or Simply "The Plan", involved the countries and the resources of Canada, Australia, New Zealand, South Africa, and Southern Rhodesia during World War II.

After earlier hesitancy, General Smuts decided that South Africa could offer facilities for training of both RAF and SAAF personnel.

An agreement that allowed for the formation of the South African "Joint Air Training Scheme" was signed by: Air Chief Marshall Brook Popham and Sir Pierre van Ryneveld. It was immediately dubbed the "Van Brookham Agreement", the official title being: "Memorandum on the Expansion of

Air Training Facilities in South Africa".

By October 1940, the scheme was operational. There was little doubt that the "Battle of the Training" as it became known, had been well and truly won.

New flying schools were established at Pretoria, Germiston, Bloemfontein and Baragwanath while a training command under Lieutenant Colonel W.T.B. Tasker oversaw the SAAF's overall training programme.

With the establishment of the Joint Air Training Scheme (JATS) under command of the UATG (Union Air Training Group) 38 South African-based air schools were employed to training Royal Air Force, SAAF and other allied air and ground crews.

Aircraft and other equipment required for the training were provided to South Africa free of charge by the United Kingdom. Under this scheme, the SAAF, by September 1941, increased the total number of military aircraft to 1 709 while the personnel strength had grown to 31 204, including 956 pilots. During its five-year existence, the JATS turned out a total of 33 347 aircrew including 12 221 SAAF personnel. This was second only to Canada which trained 131 500 aircrew.

"In Memory of the Royal Air Force, The South African Air Force and the Other Allied Air Forces who paid the ultimate price while serving under the "Joint Air Training Scheme" in the name of freedom for all."



Flying the English Electric Canberra B (I) 12

(Part 1 of 2 parts)

By

Brig Gen Des Barker (Ret)

13 May 2021 will be the 72 years since the first flight of the Canberra. Arguably the most 'potent' bomber during WWII was the de Havilland Mosquito, a high altitude, high speed bomber with no defensive armament. At that time, the advantages of speed, manoeuvrability, and altitude for survivability in a hostile environment were recognised as a 'game changer' - operating out of reach of enemy aircraft and anti-aircraft artillery. It was to be expected that the advent of the jet engine would seek to maximise the advantage of this concept; the Canberra was thus essentially the continuation of this philosophy. This article provides a 'snapshot' into flying the Canberra in the South African Air Force.

Because of the small number of Canberra's on SAAF inventory and only 27 years in Service, and with flying tours at 12 Squadron averaging approximately 5 years, relatively few pilots and navigators were privileged to have flown the Canberra. This article addresses some of the interesting features and challenges of flying the Canberra B (I) 12.

British Air Ministry Requirement

The Canberra had its origins in a 1944 Air Ministry requirement for a successor to the de Havilland Mosquito which saw English Electric's designer W. Petter complete a design study for a twin-engined fighter bomber, the P.1056.

On 7 January 1946, Air Ministry specification B.3/45 requested the production of four prototypes of the English Electric A.1 which was eventually named Canberra after the capital of Australia the first export customer, in January 1950 by Sir George Nelson, chairman of English Electric.

Due to post-war military reductions, the prototype did not fly until 13 May 1949 but by then the Air Ministry, acknowledging the potential of this aircraft, had already ordered 132 production aircraft in bomber, reconnaissance, and training variants. An early setback for the programme was that a new glazed nose had to be designed to

accommodate a bomb-aimer because the advanced H2S Mk9 bombing radar was not yet ready for production but this in turn fortunately provided time for the engines to be upgraded to the more powerful Rolls Royce Avon. With a maximum speed of 450 knots, a service ceiling of 50,000 ft and the ability to carry a 10,000 lb bomb payload, the Canberra was an instant success in the RAF.

A collateral capability in the low-level interdiction role made provision for a pack of four Hispano 20 mm cannon in the rear bomb bay and underwing pylons for bombs and rockets. An important role for the new low-level force was tactical nuclear strike carrying the Mk.7 B28 (70 Kiloton yield) or the Red Beard (10 kiloton yield), using the Low Altitude Bombing System (LABS), also referred to as 'TOSS or LOFT bombing' to allow a nuclear bomb to be delivered from low level while allowing the bomber to escape the blast of the weapon.

International Acclaim

As a first-generation jet medium bomber, the Canberra claimed many firsts and as early as February 1951 became the first jet aircraft to make a non-stop transatlantic flight and able to fly higher than any other bomber through the 1950s, set a world altitude record of 70,310 ft as far back as 1957.

Due to its ability to evade the early jet interceptors and its significant performance advancement over contemporary piston-engined bombers, the Canberra served with more than 15 air forces including Australia, Argentina, Chile, Ecuador, Ethiopia, France, India, New Zealand, Pakistan, Peru, Rhodesia, South Africa, Sweden, Venezuela, and West Germany.



In addition to being a tactical nuclear strike aircraft, the Canberra proved to be highly adaptable, serving in varied roles such as tactical bombing, photographic and electronic reconnaissance.

Canberra's served operationally in the Suez Crisis, Vietnam, Falklands, the Indo-Pakistani Wars, the 'Angolan Conflict' and numerous other conflicts and although retired from SAAF Service in 1990, it was only retired by its first operator, the RAF, in June 2006, 57 years after its first flight.

SAAF Requirement

Much as it is today, the SAAF force design of the 60's was built around the concept of a small, agile, tactical air arm employing leading edge technology. In the 1950's, Vampires and Sabres constituted the rather limited offensive capability of the SAAF and planners, looking to the next generation of frontline aircraft, identified a requirement for an interdiction capability for which the Canberra and Buccaneer were chosen to meet the requirement.

Bi-national relationships were still amicable at that stage, although by the end of the 1950's, barely just, as a Republic was declared in 1961, essentially beginning the political squeeze on the South African government which eventually saw the implementation of the UN Arms Embargo, but not before delivery of the Canberra's to the SAAF.

In essence, the SAAF required a multipurpose tactical ground attack and photo reconnaissance capability but while South Africa never introduced nuclear

weapons into service, the Canberra's ability to carry such a payload was a consideration since the nuclear capability was viewed as a potent deterrence factor.

Although the B (I) 12 model entered operational service in January 1956, the first South African Canberra's only arrived in South Africa in 1963 after 12 Squadron had been reformed at AFB Waterkloof. The first two of nine Canberra's, 3 trainers and six bombers arrived on 22 October 1963 with two further waves arriving in February and April of 1964. The bombers were the last six aircraft from the English Electric production line, while the trainers were modified RAF B Mk.2 bombers.

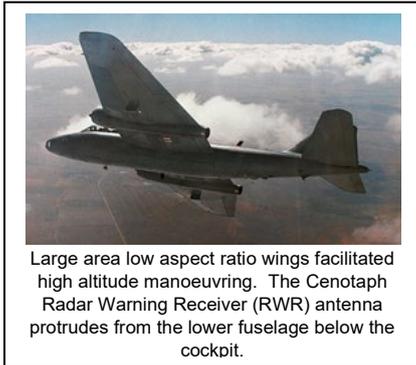
Design Philosophy

The Canberra design philosophy was very much in the Mosquito mould, providing room for a substantial bomb load, two of the most powerful engines available and wrapping it in the most compact and aerodynamic package possible. Rather than devote space and weight to defensive armament, the Canberra was designed to fly high and fast enough to avoid air-to-air combat entirely.

This concept of operations was used successfully by the SAAF into the 1980s' operating singletons deep into Africa on 'lone ranger' strategic photo reconnaissance missions but this was partially terminated during the Angolan conflict with the introduction of MiG-23s by the Angolan Air Force whereafter in high threat scenarios, the Canberra's role was changed to tactical reconnaissance escorted by 3 Sqn's Mirage F1CZs.

The Canberra design optimised some of the latest aerodynamic technologies of the day which emphasised the advantages of low aspect ratio wings (AR = 4.26) combined with a large wing area of 960 ft². At a time in which every jet aircraft designer chased after swept wings, Petter scorned the loss of performance due to sweep and went for a leading-edge sweep of only 4°, a trailing edge sweep of -14°. The use of a 19 ft chord between fuselage and nacelles and a tapered section outboard, provided for docile behaviour at high angles of attack.

Despite the low aspect ratio wings, the NACA 01240 wing section inboard (12% t/c) and NACA 0840 (8% t/c) outboard, was optimised for a relatively low angle of attack of approximately 7°. The lift dependent drag (induced) was relatively low and the 'clean' design meant that there were no fillets required to smooth the airflow which assisted in providing a relatively low $C_{d_0} = 0.0119$, a $C_{l_{max}} = 1.5$ and a L/D ratio of 15:1. A wing loading of only 48 lb/ft² was much



Large area low aspect ratio wings facilitated high altitude manoeuvring. The Cenotaph Radar Warning Receiver (RWR) antenna protrudes from the lower fuselage below the cockpit.

lower than any other designs of the time which meant that the Canberra could operate at modest angles of attack enabling operations at M0.8 without any M_{crit} effects, the flow remained subsonic.

Although the Canberra did not possess the agility of the 2nd and 3rd generation fighters of the time, at a combat weight of 35,000 lbs, a T/W = 0.43 was achievable at sea level conditions and 0.32 at altitude which complemented by the low wing loading, enabled the manoeuvrability of a fighter. The lift and thrust boundaries for this generation of aerodynamics were truly remarkable in that it was possible to pull 4g instantaneous and even sustain 3g at 45,000 ft at a mid-weight of 35,000 lbs.

There were cases where Mirages 'jumped' Canberra's at 40,000 ft in which, with good 'mission controllers', enabled the Canberra pilots to visually acquire the 'bogeys' and at the moment critique of either simulated missile launch or guns, to do a missile or guns break into the bogey which saw the Mirage 'heading off into the sunset at high-speed trying to generate turn rate'. Integrated with adequate specific excess power, it allowed operations at heights at the time, no other aircraft were operating at and

it was not uncommon for 12 Sqn to operate at 50,000 ft during exercises.

From the aforementioned, it is clear that the secrets of the Canberra successes in high altitude operations lay in the design of the wings, the large wing area was essentially responsible for the ability to generate significant lift. Because of the low aspect ratio of course, a role change to low altitude interdiction made it an ideal platform for ground attack. 12 Squadron often won the air-to-ground trophy for guns and rockets in SAAF annual weapons competitions – it was a really stable air-to-ground guns platform.

Aircraft Description

Thrust was provided by a pair of 7,500 lb axial flow, Rolls-Royce Avon turbojets enabling a maximum take-off weight of 56,250 lbs

The pilot was housed under a fighter-style, bubble canopy with approximately 270° unobstructed view from the elevated cockpit providing a field of view which enabled pilots to visually track attacking fighters. The key to survival in the air combat arena with which to supplement the speed, manoeuvrability, and height advantage over fighters, was to have visual contact in order to assume the correct defensive posture should that be required for evasive manoeuvring.

Based on the cockpit layout, it could be safe to assume that the definition for ergonomics in 2nd generation jet designs had not yet been coined. Typical early generation cockpit design consisted of many toggle switches, gauges, and pushbuttons – often in what appeared to be random order – if they were within reach of the 50th percentile pilot, then that was where the engineers stuck them. The Canberra cockpit was just like that.



No ejection seat for the navigator despite the display of two ejection seat danger signs on the fuselage. (Paul du Bois)

Contentiously, only the pilot had a Martin-Baker ejection seat, the navigator had none, only an escape hatch and parachute which enabled manual egress; this philosophy was questionable and basically implied that navigators were expendable. Considering the vulnerability of navigator survival, it was surprising how navigators just accepted their lot in Canberra life. There were, however, isolated cases where navigators requested postings off Canberra squadrons because there was no ejection seat available to them, only the pilot.

All flight controls were conventional with ailerons, four-section split flaps and on the top and bottom surfaces of the wings, airbrakes. No power controls for an aircraft that size was surprising but clever use was made of internal shrouded balances on the ailerons, spring tabs on all control surfaces and horn balances on the elevator and rudder to alleviate the heavy loads at high speeds.

In addition, a variable incidence tail plane was used to avoid trim drag at high speeds by moving the stabilator instead of an elevator; this also made pitch control of the aircraft to cope with the longitudinal trim changes resulting from bombs release, easy to handle.

Role Equipment

By the 1970's, the avionics were essentially in keeping with the times, being a basic autopilot providing a height and heading hold



In the 1980's, the avionics were upgraded to include a new autopilot, a flight director and VOR/ILS which enabled flying coupled ILSs. (Pieter van Schalkwyk Collection)

Navigation System (TANS) - no fancy GPS in those days, plotting charts and map reading were the navigator's tools of his trade.

capability to reduce pilot workload on long missions, Doppler radar to provide groundspeed and drift angle to the navigator for plotting purposes, and a Decca Tactical Air

The photo recce camera suite available to the Canberra ranged from a G.45 camera installed on the starboard wing, a F.24 camera aft of the bomb bay, a F.95 in the nose which operated through the bomb sight and a Wild RC.8 Camera used for mapping, charting and scientific applications.

The reconnaissance fit was contained in a modified conformal gun pack canoe which included the Zeiss 24" and Omera 6" cameras. Up to five Zeiss cameras arranged in a fan with the 6" Omera giving a wider field of view for photographic interpretation. There was also the 36" F-96 used as a vertical 'pinpoint' camera in a circular camera hatch just aft of the bomb bay as well as the Wild RC8 plotting camera in a round camera hatch in the rear fuselage. Also in this hatch was a rear facing oblique F95 camera mounted to record bomb damage assessment for low-level Alpha bombing.

Despite the UN Arms Embargo, without any self-defence and in an effort to improve survival indices against electronic missile threats, the Canberra was fitted with a locally developed electronic warfare defence system including a radar warning receiver (RWR) which included a radar guided missile launch warning capability, underwing chaff dispensers, and by the mid-1980s, an active radar jammer jamming pod was carried underwing. For obvious reasons, the fire-control radar warning indicator was positioned in the direct line of sight of the pilot.

The high altitude, long endurance capability of course made it an ideal for electronic signals gathering and as such, a low frequency surveillance radar warning antenna was fitted under fuselage, below the cockpit as was often referred to on the squadron as a 'koekblik'.

The electronic suite fitted to the Canberra was comprehensive and provided information on the enemy's alert status which combined with surprise, was utilised to safely penetrate enemy territory during 'lone ranger' surveillance and strike missions.

Flying the Canberra B.12

Despite its high performance, the Canberra,

with its well harmonised controls and excess power, was relatively easy to fly at all altitudes; however, there were some early generation technology idiosyncrasies that were required to be managed through training and procedure. The specific excess power, the significant fuel load and range, the navigation systems, the photographic recce systems, and the electronic warfare technologies introduced to for surveillance and improve survival indices, made the Canberra spectrum of missions, all doable.

Engine Start

In comparison with modern aircraft engine starting systems, the engine start procedure was fairly busy for 2nd generation jet engines, several switches and fuel cocks were required to be opened prior to engaging the Starter pushbutton. Master Switch On, LP Cocks OPEN, LP Pumps On, Engine Master Start Switch On, Ignition Switch On and only then the Starter pushbutton was depressed while simultaneously opening the HP Cock.

What made the Canberra starting cycle interesting was that the engine was not initially rotated by an electric starter/generator but was rather fired by one of three cartridges which initially spooled the engine up to 1400 RPM whereafter automatic acceleration to 2,750 RPM/530°C JPT max, idling continued. This vintage of engines was certainly not



To any unsuspecting person near the aircraft, the ignition of the cartridge was announced with a very loud 'whoosh' as black smoke poured out of three cartridge exhausts – the engine start was something to behold. (12 Squadron SAAF)

'carefree handling', they were not fitted with FADEC and pilot care in the lower RPM bands was essential as the RPM was 'nursed' into the higher RPM band up until approximately 6,500 before the RPM could be increased – this was particularly critical in the low speed/high angle of attack regime

such as stalling and the 'go-around'. In fact, 'touch and go' landings were prohibited on the B.12 except in an emergency and then in that case, special procedures were required. There was no 'synchro-phaser' to synchronise the engines, Canberra pilots developed very sensitive ears to synchronise the engines.

Taxying

Differing from the two-seater T. Mk. 4 trainer's hand controlled pneumatic braking system, the B.12 had conventional, differential toe brakes, but strangely, for an aircraft of that size, no nose-wheel steering. Taxying, however, was easily accomplished by the combined use of toe brakes and asymmetric thrust.

Take-off

Take-off at sea-level at a T/W = 0.28 at 56,250 lbs was satisfactory, but at 'hot and high conditions' where the thrust output was degraded to approximately 12,500 lbs (T/W = 0.22) due to the insidious effects of density altitude, was an interesting challenge. Due to operational requirement for long range interdiction missions, maximum all up weight take-offs were not at all that uncommon. For safety purposes though, Weight, Altitude, Temperature (WAT) limits were applied and, in some cases, aircraft were flown to AFB Hoedspruit (elevation 1,800 ft) to enable maximum all up weight operations.

The complication was that due to the combination of weight and a relatively short runway, no practical balanced field length was available. There was no classical V_1 , but rather an accelerate stop speed which at typically 120 KIAS, was less than VR (130 KIAS) while V_2 , safety speed at MAUW, was relatively high at 180 KIAS.

Engine handling was an acquired skill - you never slammed the engine open for if you did, a compressor stall was guaranteed, also the compressor was very sensitive to off-ideal flow conditions caused by crosswinds.

Take-off was performed by applying power on both engines simultaneously to 7000 RPM against the brakes to check for synchronisation and satisfactory swirl vane

operation and then only increasing both engines to full power 7,950 RPM, simultaneously releasing the brakes while ensuring the maximum JPT of 680 °C was not exceeded. Aircraft acceleration was monitored vigilantly; brakes were used initially for directional control until approximately 50 KIAS when the rudder became effective.

Before the lengthening of AFB Waterkloof's 10,000 ft runway to 15,000 ft in the late 1980's, hot and high take-offs were particularly interesting and it was critically important to use the correct heavy weight take-off technique. The dynamics of the take-off required an acceleration check at approximately 90 KIAS to enable an early rejected take-off in the event that the engines were not generating the advertised thrust, or acceleration was not as required.

A 30°C day at AFB Waterkloof (elevation 4,900 ft/density altitude 7,600 ft) at maximum all up weight (MAUW) required the nose to be kept down until rotation at 130 KIAS with lift-off occurring at 140 KIAS. By VR the accelerate/stop distance had been passed 'many knots ago' and there was still another 40 kts acceleration required after lift-off before V_2 . Early nose wheel rotation could lead to significant increase in drag and subsequent take-off distance by up to 20% while delayed rotation on the other hand could result in exceeding the nose wheel tyre limiting speed of 147 kts groundspeed. At 56,000 lbs, the minimum ground roll was approximately 7,300 ft but the distance to 50 ft was 10,750 ft – 750 ft longer than the runway.

Another challenge was the Emergency-Brake-On-Speed (EMBS). At high weights and short runways, the choices between running out of runway or burning the brakes out if things went wrong, were challenging.

At a take-off weight of 45,000 lbs on a 6,000 ft runway at 15°C with zero wind stipulated

an EMBS of 108 KIAS and a Stop Speed of 118 KIAS.

One had to allow the aircraft to fly off and not pull it into a less than optimum angle of attack, lest the 'drag increase and the ground rise up to smite thee'. The notice board on the public road to the north of AFB Waterkloof "Thundering Jets, The Sound of Freedom" took on a special meaning for 12 Squadron aircrew and motorists that happened to be under the flight path of a fully loaded Canberra taking off on runway 01. Hot and high take-offs at MAUW were as exciting to watch from the flight line as it was from the cockpit.

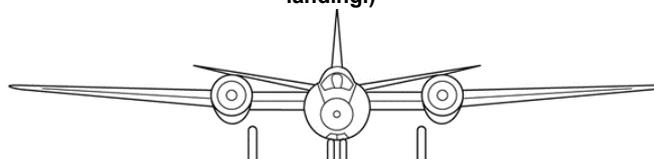
The fun didn't stop there, the more critical part of the take-off was the period between lift-off at 140 KIAS to a safety speed of 180 KIAS. During this period of what used to, on the very hot days, feel like 'forever', in the event of an engine failure, the only option available to the pilot was to lower the nose and descend in the valley to the north of AFB Waterkloof or to the Rietvlei valley to the south to accelerate to 180 KIAS before a positive rate of climb would be achievable.

For the pilot there was always the fall-back option of ejection, BUT for the 'poor' navigator strapped into the crash seat or lying in the nose, there was no ejection

option and the height was far too low for safe parachute operation. It is understandable that during this phase of flight, maximum attention from 'eyes and ears' was given to aircraft acceleration and engine performance parameters; heavy breathing from the navigator was not considered lewd.

Today, the Canberra would not meet certification criteria, certainly not under 'hot and high' conditions would the modern requirements for climb gradients under asymmetric conditions, be complied with, not 1st or 2nd segment.

(Part 2 of "Flying the English Electric Canberra B (I) 12" will include: Flying the Canberra B.12 from climbing to landing.)



THE SPOOKIEST STORY IN VIETNAM: THE AC-47 GUNSHIP

By
Chris Eger and MilitaryFactory.com

Despite its service entry in 1941 and an American military career spanning across both World War 2 (1939-1945) and the Korean War (1950-1953), the Douglas C-47 "Skytrain" transport saw renewed life during the American involvement in the Vietnam War (1955-1975) as the converted AC-47 "Spooky" gunship.

The AC-47 was an interim solution intended for Close-Air Support (CAS) for friendly ground forces and was capably armed with 3 x 7.62mm General Electric SUU-11A miniguns for the role. 53 x C-47 United States Air Force (USAF) transports were



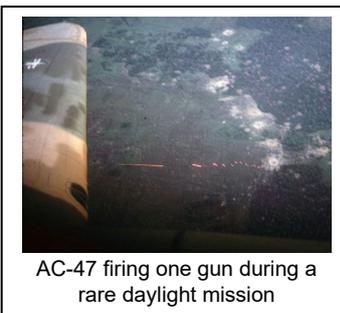
converted for the gunship role, beginning a long, illustrious line of "Spooky" gunships born from similar beginnings (i.e., the Lockheed C-130 "Hercules" transport reborn as the AC-130 "Spectre" gunship). AC-47 Spookies were introduced in 1965 during the run-up of increased American involvement in Southeast Asia. The C-47 was itself the militarized form of the Douglas DC-3 airliner. AC-47s were from C-47D production marks (and therefore formally designated "AC-47D") and initially recognized under the designation of FC-47D for "Fighter-Cargo". However, fighter pilots got their way and the "F" in the designation was changed to "A" for "Attack".

Fixed-wing gunships proved a viable CAS platform during the conflict where they could loiter on station and deliver relatively accurate fire onto enemy forces within proximity of operating allies - this accomplished through a banking action with the guns trained downwards off of portside. Fixed-wing strike jets offered a different sort of strike element for war planners, one that was fast-moving and could carry mixed ordnance loads but lacked the low-level, low-speed flight characteristics offered by prop-

driven types such as the AC-47. The use of gunships grew considerably as Vietnam

War raged and helicopter gunships further solidified the role of such aircraft in the U.S. Air Force inventory - one that remains even today (2014). The conversion of existing C-47 into make-shift gunship platforms marked the first time that the American military opted for this type of aircraft.

Internally, the three miniguns were installed with their mounting hardware and ammunition stocks along the port side - two at cabin windows and the third gun system at the cargo door. The guns held a rate-of-fire of 6,000 rounds-per-minute because of their rotating Gatling concept. Such a weapon also burned through ammunition at quite a rate so short bursts were typically used. A general ammunition load for sorties was about 16,500 x 7.62mm cartridges. While gunners were kept aboard to monitor the gun's performance and make any necessary repairs, the weapons were controlled directly by the pilot through his control yoke. The guns could be fired in unison for maximum effect or individually as the situation warranted. A typical crew number eight



includes two pilots, a navigator, a flight engineer, a loadmaster, two gunners, and an observer (typically from the South Vietnamese military). While primarily outfitted with the GE miniguns, some early-batch forms were delivered with 8 to 10 x 0.30 caliber Browning machine guns due to minigun shortages. Still, others were operated with only 2 x minigun mountings. The AC-47 also stocked 47 x Mk 24 series flares for illumination. Typical engagement altitudes ranged from 2,500 to 3,000 feet. A gun sight allowed for the needed accuracy

when banking the aircraft.

Of note is that base C-47 transports arrived in the Theater earlier in February 1962 through these were strictly used on illumination runs - these aircraft known as "flare ships". To maximize effectiveness and minimise risk to the gunships, they typically flew at night with call signs Spooky and Puff, each for obvious reasons.

Of the 53 AC-47s delivered, about 41 of these inventories saw combat service in the Vietnam War. Some twelve were lost to combat reason while nineteen airframes were lost in all - proving the aircraft was not invulnerable to all manner of battlefield dangers. It was slow and poorly protected which made for disastrous results in some cases.

The AC-47 - forgotten by many in today's technology-laden world of military hardware - was a potent platform to the extreme - a lifesaver to some and a life-taker to her enemies. Despite their age, some air forces continue their operation from ex-USAF stocks, this being Colombia and El Salvador for counter-insurgency work.

They have been outfitted for the carrying of conventional drop ordnance and feature modern implements such as FLIR (Forward-Looking InfraRed).

Former operators beyond the United States have become Cambodia, Indonesia, Laos, Philippines, Rhodesia, South Africa, South Vietnam, and Thailand.



U.S. forces in Vietnam operated AC-47s through 3d Air Commando Squadron (from 1968 to 1969), the 4th Air Commando Squadron (from 1964 to 1969), and the 5th Air Commando Squadron of the 14th Special Operations Wing. From August 1968, their names were revised from "Air Commando" to "Special Operations".

Action reports concerning these early American gunships proved critical in the upcoming C-130 ("Gunship II") and the subsequent Fairchild C-119 ("Gunship III") conversion programs.

The days of the AC-47 Spooky Gunship lasted for long, even in 2016, they were still flying on patrols over Colombia. That South American nation has a reputation for its production, trade, and smuggling of Cocaine and Marijuana.



The Fairchild AC-119G Shadow and AC-119K Stinger were twin-engine piston-powered gunships developed by the United States during the Vietnam War. They replaced the Douglas AC-47 Spooky and operated alongside the early versions of the AC-130 Spectre gunship.



Piaggio P166S Albatross aircraft goes missing near Dassen Island

**CALL BACK
THE PAST**



Date:	06 May 1976
Time:	14:40 LT
Type:	Piaggio P . 1665 Albatross
Owner/operator:	South African Air Force
Registration:	894
C/n / msn:	456
Fatalities:	2
Occupants:	2
Aircraft damage:	Written off (damaged beyond repair)
Location:	The Atlantic Ocean, off Dassen Island; South Africa
Phase:	En route
Nature:	Military
Departure airport:	FAYP (Ysterplaat)
Destination airport:	FAYP (Ysterplaat)

The South African Air Force used Piaggio P166S Albatross aircraft in the maritime reconnaissance role from 1969 to 1993.

During one such patrol, on May 6, 1976, a P166, tail number 894, crewed by Major R.C. Carter and Captain G.M. Rossouw crashed into the Atlantic Ocean off Dassen Island situated off the west coast, north of Cape Town. At 2:35 pm they reported all being well on board. Four minutes later, at 2:39 pm a mayday call "we are 40 miles from" was received from the aircraft. Moments later the aircraft disappeared from radar and an extensive search was launched.

A Shackleton and an Albatross conducted the aerial search while surface assistance was received from the SAS President Steyn, SAS Pretoria, SAS Johannesburg as well as two crash boats from Langebaan. Apart from a wingtip tank and a dinghy, the aircraft was not found, and the search was called off.

On June 15, 1976, and August 17, 1976 pictures were published in a local newspaper, the Cape Argus, that was sent in by a fisherman claiming to have taken them from a small boat close to where the P166 was believed to have crashed. The police and the SAAF investigated these pictures and the SAAF reported that the pictures looked genuine. However, they were later thought to be a hoax.

Many years later an Irvine & Johnson fishing trawler trawled up a large section of the aircraft which was brought ashore at Saldanha.





Memorial Services 2021/22

Date	Time	Service	Venue	Town
APRIL 2021				
3	10h00	Koevoet Veterans Memorial Service	Voortrekker Monument	Pretoria
4	10h00	RAFA Memorial Service	Bays Hill	Pretoria
18	TBN	Gunners Ass Memorial Service		Potchefstroom
MAY 2021				
16	10h00	SA Air Force Memorial Service	Bays Hill	Pretoria
23	10h00	Heritage Foundation Wreath Laying	Voortrekker Monument	Pretoria
23	15h00	Smuts Memorial Service	Smuts House	Irene
JUNE 2021				
6	11h00	SAPPERS Memorial Service	Sappers Rust	
JULY 2021				
11	10h00	Delville Wood Memorial Service	Burgers Park	Pretoria
11	10h00	Delville Wood Memorial Service	Soweto	Johannesburg
25	10h00	Korean War Veterans Ass Service	Bays Hill	Pretoria
AUGUST 2021				
15	11h00	Border Boys Parade	Eloffsdal	Pretoria
21	TBN	61 Mech Memorial Service	Ditsong	Johannesburg
21	10h00	SAP COIN Memorial Service	Doornpoort	Pretoria
SEPTEMBER 2021				
5	11H00	WARSAW Flight Commemoration Service		Johannesburg
12	10h30	RLI RAFA Battle of Britain Service	Bedfordview	Johannesburg
12	09h00	International Day of Peace Service	NGK Raslow	Pretoria
OCTOBER 2021				
10	10H00	Alphine 44 Memorial Service	Bays Hill	Pretoria
24	11h00	Battle of El Alamein Pretoria District MOTH	Coal Box MK2	Pretoria
NOVEMBER 2021				
7	09H30	Italian Prisoners of War Memorial Service	Italian Cemetery	Zonderwater
11	17h30	Cornwall Hill Service	Cornwall Hill	Pretoria
14	11h00	Remembrance Sunday Memorial Service	Commonwealth War Graves Cemetery	Johannesburg
DECEMBER 2020				
5	09h00	SAMHS Veterans Ass Memorial Service	1 Mil	Pretoria





Life is not always easy, sometimes you get tired of fighting or faking a smile when your soul wants you to cry. Everyone you meet is fighting a battle you know nothing about. Be kind. Always.

We are nearing the end of the first quarter for 2021 and things are looking slightly better, with lockdown restrictions down to stage one. I am elated to see that the number of branches who submitted news for the Branch News has slightly increased with more branches sprouting their news this month.

It is with a heavy heart that I sit here busy compiling this edition of our newsletter knowing that we have lost one of the biggest contributors to the Flying Spirits due to a flying accident. Maj Gen Des Barker (Ret) was always willing and ready to help with a story when called upon. We are planning an article on this great man in our May issue in celebration of his life and who he was.





Des †
Philip;
Marianne;
Christel;
Johann



• Account Name:	The South African Air Force Association
• Bank:	ABSA
• Branch:	Mall@Reds
• Code:	632005
• Account Number:	16 6016 7699
• Ref:	Your name and Surname



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