THE ROLE OF SOUTH AFRICAN ARMOUR IN SOUTH WEST AFRICA/NAMIBIA AND ANGOLA: 1975-1989

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1. INTRODUCTION

Since 1960, there was a growing international dispute about South Africa's mandate over South West Africa(SWA)/Namibia. The South West African People's Organisation (SWAPO) commenced an armed struggle for independence in 1965.[1] In the early 1970's, South Africa already had a significant military and police presence to curb SWAPO activities. In 1973, the South African Defence Force (SADF) assumed responsibility for the defence of SWA/Namibia from the South African Police (SAP) and, within a few months, were engaged with SWAPO.[2]

Until 1974, Eland armoured cars were deployed in the Caprivi and Katima Mulilo in SWA/Namibia.[3] By the end of 1975, following the collapse of the Portuguese African empire, South Africa intervened in the civil war in Angola, where a Cuban presence was perceived as a security threat to South Africa, Zambia and Zaire. These countries, with the support of the United States of America, invaded Angola in 1975. This initially "covert" operation (codenamed Savannah by South Africa) marked the end of regional détente and the start of South African cross-border operations.[4] Prior to Operation Savannah there was much uncertainty about the role of armour on the SWA/Namibia border. With Operation Savannah a more prominent and clear role for armour developed.

During the 1970s and 1980s, the SADF's role was to contain insurgency in the SWA/Namibia theatre and to ensure that UNITA(*Uniao Nacional para a Independência Total de Angola*) continued its armed struggle against the MPLA (the

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1 HJ van Aswegen, "Suid-Afrika en Afrika, 1961-1991" in T Cameron and SB Spies, **Nuwe geskiedenis van Suid Afrika** (Human and Rousseau, Cape Town, 1991), pp. 297-8.

2 South African Army, Central Library, Pamphlet 6913, Box 290, p. 3.

3 Correspondence with Lt. Col S Carroll, SO1 Research and Development, School of Armour, 4 September 2006.

4 W Steenkamp, **South Africa's border war, 1966-1989** (Ashanti, Gibraltar, 1989), p. 196.

Popular Movement for the Liberation of Angola) government in Angola.[5] The SADF therefore conducted two different campaigns - the primary campaign being that against SWAPO, mainly in Namibia and usually involving counter-insurgency operations (COIN). This campaign, however, often extended into Angola, with mobile semi-conventional operations, to pre-empt the SWAPO annual rainy season offensives.[6] The other campaign in support of UNITA was less prominent, but escalated into conventional-style operations between 1987 and 1988, when Russia and Cuba intervened in support of the MPLA. It culminated into operations Modular, Packer and Hooper in southern Angola, with the final stand-off at Cuito Cuanavale in February 1988. Since Modular the SADF faced FAPLA (People's Armed Forces for the Liberation of Angola) brigades augmented with powerful tank formations.[7] South African armour experienced its most intensive combat in this conflict during the latter operations and fought outnumbered in men and material.[8]

The aim of this paper is to discuss the role of South African armour during the South West Africa/Namibia conflict. It commences with a discussion of the role and definition of modern armour. It then explains how armour was employed in the SWA/Namibia and Angola theatres of operations and by dividing the role of different armoured fighting vehicles into eras, starting with the Eland, then the Ratel and lastly the Olifant tank. The role of armour in de-mining operations and the stopping of SWAPO's last wave of cross-border attacks in the last phase of the conflict is then discussed. The last part of the paper is about the pioneers of South African armour doctrine.

2. UNDERSTANDING MODERN ARMOUR

The development and use of armour and particularly tanks during World War I (1914-1918) introduced a "new kind of cavalry" which changed the nature of modern warfare.[9] During this war, armour developed a tactical advantage over infantry with its simultaneous combination of firepower, tactical mobility through motorisation, and protection. Armour could overcome the machine-gun, barbed wire and trenches to restore some flexibility and movement to the stagnant attrition warfare of the Western Front. Infantry now required suitable cover and new weapons to compete with armour on their own. Land warfare now had a system

5 H Heitman, **War in Angola, the final South African phase** (Ashanti, Gibraltar, 1990), p. 327.
6 PL Moorcroft, **African nemesis, war and revolution in southern Africa 1945-2010** (Brassey's, London, 1990), p. 205.
7 J Breytenbach, **They live by the sword** (Lemur, Alberton, 1990), p. 244.
8 Heitman, p. 121.
9 A Jones, **The art of war in the Western world** (Oxford University Press, Oxford, 1987), p. 484.

that shared the combination of characteristics that once only existed in the domain of naval warfare, namely firepower, mobility and protection.

World War II, which manifested the dynamics of modern warfare, clearly indicated that the theories advocating the independent use of armour were flawed.[10] During this war, tanks could not break through defensive systems on their own and required artillery and infantry to primarily accomplish this. Tanks proved most useful in breakouts and exploitation, while armoured cars proved most useful in reconnaissance, their flexibility proving invaluable.

Armour is generally defined as fighting vehicles with strong protective metal covering.[11] The Military Dictionary defines armour as the general name for the tooth arm deploying tanks and armoured cars.[12] The South African Armoured Corps (SAAC) adopted the following American definition of armour: "Armour is a concept. It is not a tank or a specific weapon system, but rather a state of mind - an approach to combat that stresses firepower, mobility, and shock effect."[13] This definition is useful in explaining that armour is not only about the "hardware" or weapon systems such as tanks, armoured cars or anti-tank missile systems (in the case of South Africa), but also about suitable "software" or thought in applying it. It therefore supposes an application of flexibility of mind when employing armour. It identifies some of the characteristics of armour namely firepower and mobility, while protection can also be added. These characteristics enable armour to produce shock effect on the battlefield, especially on an opponent's flanks and rear. The ability to produce shock action distinguishes armour from the role of mounted infantry.

Modern armour (and tanks in particular) also has a unique advantage: the mobility and protection to counter-attack.[14] Tanks further provide the ability to attack reinforced positions or to conduct a decisive battle.[15] *Armour* can therefore be defined as armoured fighting vehicles with an outstanding combination of protection, mobility and firepower which should be utilised with a flexible mindset to adequately perform the modern day role of cavalry which is to manoeuvre, attack, or counter-attack in order to produce shock or other effects. Armour should

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10 H Strachan, **European armies and the conduct of war** (Routledge, London, 1983), p 184.
11 P Procter, **Longman dictionary of contemporary English** (Longman, London, 1978), p. 45.
12 South African Defence Force, **Military dictionary (MD) SA Defence Force** (Personnel Division, Director Language Service, Pretoria, undated), p. 32.
13 South African Army, **Book 1: South African Army armour philosophy** (SA Army Armour Formation, Vol. 1, January 2005), p. 4-2.
14 Strachan, p. 204.
15 WG Lombard, "Armour in the SANDF: a strategic and practical perspective" in JK Cilliers and B Sass (eds), "Mailed fist; developments in modern armour", **Institute for Defence Policy Monograph** (Institute for Defence Policy, Halfway House), No 2, March 1996, p. 13.

therefore be understood against the background of its role, the way it is utilised and its impact rather than only its equipment.

3. THE ERA OF THE ELAND: OPERATION SAVANNAH

During the 1950s and 1960s, the SADF enhanced its manpower capacity through conscription and also improved its armoured car capability in time for the SWA/ Namibia conflict. During the late 1950s, the SA Army decided to replace its outdated Marmon-Herrington armoured cars with a new generation armoured car.[16] In 1961, the French-designed Panhard AML-60 (later Eland-60) and Panhard 90 (later Eland-90) armoured cars were produced under licence in South Africa.[17] The Panhards were later upgraded to two Eland versions in 1964 which had larger hulls. The Eland-60 had a two-man turret and a 60mm breach loading mortar, while the Eland-90 had a 90mm low-recoil gun, also with a two-man turret. In 1969 already, some armour officers started to debate the replacement of the Eland with a more suitable armoured car for the SADF.[18]

Namibian and Angola terrain was not ideal for armour and differed drastically from the terrain where South African armour forces were trained. Armour training was presented at 1 Special Service Battalion (1SSB) in Bloemfontein, 2 Special Service Battalion (2 SSB) in Zeerust and at D-squadron (2 SSB), Walvis Bay.[19] The Angolan terrain has very thick bush which restricted mobility, the traverse angle of the turrets, as well as visibility. It also restricted the execution of text book movement of armoured vehicles.[20] The terrain of the theatre of operations differed from the corps training areas and therefore armour crews had much to learn in the bush.

The doctrine and tactics of the armour during Operation Savannah was unrefined and still based on old British doctrine of World War II.[21] Very little doctrine development had taken place since then. The SAAC entered the SWA/Namibia conflict with outdated doctrine.

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16 South African Army, **Pantseroperasies** (Department of Defence), p 1-8.

17 H Heitman, **The South African war machine** (Central News Agency, Johannesburg), pp. 38, 128.

18 Interview with Brig. (Ret) HB Smit, Former Officer Commanding of 7 SA Division, 5 September 2006.

19 Correspondence with Brig. Gen. BC Gildenhuys (General Officer Commanding SA Army Armour Formation), 1 September 2006.

20 Interview with WO1 HJ Venter, SA Army Armour Formation Warrant Officer, Pretoria, 15 August 2006.

21 Correspondence with Gildenhuys, 1 September 2006.

The training of Eland armoured car crews and their leader group prior to Operation Savannah was not sufficient and generally entailed "crash courses".[22] While the Eland armoured car course was fully developed and up to standard, the time for training was limited. The crews trained in early 1975 for deployment in August 1975, however, received significantly better training than other intakes before and shortly after them. During the SWA/Namibia conflict, armour training focussed mainly on conventional operations, but attention was also paid to training for COIN operations. Despite the initial, inadequate training of armoured car crews, they performed well when thrown into the deep end during Operation Savannah. The armour crews had a lot of "dare and guts" to adapt quickly.

In 1976, during Operation Savannah, 35 Centurion Mk 5 (Semel) tanks were deployed in northern Namibia to secure the border area, but did not play a significant or active role during the operation.[23] This Centurion version was hampered by the lack of a suitable diesel engine. South African tanks only saw action towards the end of the conflict in 1987.

The Eland armoured cars formed the bulk of armour forces deployed during Operation Savannah in Angola and COIN operations in SWA/Namibia. The Eland was the only available mobile fire support platform in the middle 1970s and therefore the Eland-90 was utilised in the role of a light tank, in addition to its normal armoured car functions.[24] The Eland-90s (and later the Ratel-90s) with their 90mm guns performed meritoriously against FAPLA T-54/55 tanks, with well-trained crews.[25] The SAAC believed that they could take on tanks with armoured cars and "got away with murder" in the process.[26] This role of the Eland-90 contradicted South African Armoured Corps (SAAC) doctrine, but continued when the Ratel-90 replaced it in conventional roles. The situation would, however, have been much different if FAPLA had T-62 tanks deployed in Angola. One former armoured car squadron commander made the following remark: "Personally I don't want to be in a Ratel-90 (or Eland-90) and on the same map as a T-62." The official armour doctrine made sense, because armoured cars are vulnerable against tanks, anti-tank weapons, landmines and difficult terrain. The South Africans used armoured cars in a tank-role with much risk, but significant success.

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22 **Ibid**.
23 SAA, **Pantseroperasies**, p. 1-8.
24 Correspondence with Col A Retief, South African Defence Attaché to Egypt and Jordan, 22 August 2006.
25 Heitman, **The South African war machine**, p. 44.
26 Correspondence with Gildenhuys, 1 September 2006.

During Operation Savannah, the role of the Eland armoured cars was to clear main routes such as roads and railways lines of MPLA forces in support of UNITA.[27] Therefore Eland armoured cars were used predominantly on roads. Many of the roads in Angola were elevated and built-up for sufficient drainage for the rainy season which provided better mobility than off-road areas in wet conditions. Vehicles negotiating off-road movement risked getting stuck or pinned down under fire which was another reason for making use of roads. The Eland armoured cars relied on road movement which explains the quick gains that were made during the early stages of Operation Savannah.

Eland armoured cars were mainly utilised in squadrons which consisted of four troops, with each troop having two Eland-90s and two Eland-60s. This provided a mix of direct and indirect fire to troop commanders. The Eland-60's illumination rounds were very useful during night attacks and could also fire smoke for masking. The Eland-60 with its limited firepower was, however, not as useful as the Eland-90 with its 90mm gun.[28]

The Eland had relatively good mobility in the sand although it struggled in big, dense bushes.[29] Its good mobility enabled it to deploy and re-deploy quickly. With their small hulls the Elands could form open laagers in small areas and camouflage with little effort. Their petrol engines enabled them to be employed with some stealth during the day and night. The Eland had few flat tyres and was also easy to maintain by the crews themselves. Their mobility and easy maintenance enabled them to operate independently for up to seven days.

The Eland had several shortcomings, one of which was a very limited storage capacity as it could carry only 20 main weapon rounds (90mm).[30] The crew commander's copula was too low and later had to be raised to improve vision. The Eland also gave mechanical problems, especially with bevel boxes. With the introduction of the Ratel, the Eland with its limited mobility became a frustration when operating with Ratels. Although it was easy to maintain, its mechanical problems earned it the nickname *gesleepte geskut* (towed guns).

Once in contact, the Eland armoured cars enjoyed the advantage of firepower and protection over opposing infantry.[31] They did, however, with their low profiles

27 Correspondence with Carroll, 4 September 2006.
28 Correspondence with Retief, 22 August 2006.
29 Correspondence with Lt-Col D Hattingh, SO1 Force Structure, SA Army Armour Formation, 4 September 2006.
30 Correspondence with Carroll, 4 September 2006.
31 Heitman, **The South African war machine**, p. 163.

experience difficulties to observe opposing force movements in thick bush.[32] While spotting tanks was a particular problem, the Eland with its low profile had an even chance to spot FAPLA tanks which also had low profiles. To avoid being hit by RPG-7 anti-tank weapons, the armoured cars had to keep moving during engagements.[33] This was not only done as a drill from text books, but also as a natural response by crews under fire.[34] During engagements the dense vegetation restricted observation and tactical movement of armoured cars.

Armoured cars in general often played a supporting role to the infantry throughout the conflict. Occasionally armoured cars would also protect artillery when delivering harassing fire.[35] Armour and other mobile elements were surprisingly successful during COIN operations in Ovamboland with its large flat areas which allowed armour to cover large areas. This enabled armour to conduct sweeps and cordon-and-search operations. In a few instances insurgents were surprised by armoured car patrols. In the mountainous terrain of Kaokoland, however, armour had a very limited role due to the constraints on mobility. Armoured cars were also utilised to support infantry while they were tracking insurgents.[36] Armour was useful during follow-up operations, but had the disadvantage of vehicle noise, especially in difficult terrain which gave away their position. They were also used for navigation, reconnaissance, limited attacks, direct fire support to infantry, reaction forces during incursions, relay stations, military convoy escorts, road blocks, area patrols and road patrols. While armour could cover long distances on roads, it made them vulnerable to mines. Armoured cars were successful in supporting COIN operations.

Armoured cars and Elands in particular were useful in operations other than war (OOTW). They supported other departments during escort duties by escorting paymasters to the pay salaries of, among others, teachers and waterworks personnel.[37] The Elands were further used to do surveillance, protect key points, and gather information.

Armour squadrons received logistical and administrative support from their own A-echelon, also known as the administrative troop. This echelon consisted of military trucks carrying ammunition, fuel, water, tyres and general stores.[38] An ambulance,

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32 W Steenkamp, **Borderstrike**! **South Africa into Angola** (Butterworths Publishers, Durban), p. 122.
33 Heitman, **The South African war machine**, p. 163.
34 Interview with WO1 HJ Venter, SA Army Armour Formation Warrant Officer, Pretoria, 15 August 2006.
35 Correspondence with Hattingh, 4 September 2006.
36 Heitman, **The South African war machine**, p 18.
37 Correspondence with Carroll, 4 September 2006.
38 Correspondence with Gildenhuys, 1 September 2006.

as well as recovery and technical vehicles, also formed part of the A-echelon. The technical support personnel for the vehicles, also known as the "tiffies", were of high standard and they fulfilled an indispensable role. They developed a close relationship with the SAAC and became part of its culture. During patrols, armoured car troops usually took everything they required to sustain themselves, but replenishment points were sometimes established when needed. Armoured car squadrons had their own logistical elements deployed with them, but occasionally higher headquarters grouped different A-echelons centrally for large-scale operations.

Before and during Operation Savannah, the logistical support system as a whole was inadequate. The logistical support units at Grootfontein were not yet well-established. A-echelon commanders (usually sergeant-majors) therefore literally had to borrow, steal and scrounge to support their squadrons.[39] Although the logistical system improved significantly afterwards, such informal, unauthorised practices continued even towards the end of the conflict when critical and specialised commodities had to be obtained as quick as possible.[40] During Operation Savannah, armour crews often ran out of basic supplies such as toothpaste and echelon commanders often had to "replenish" their stores from local Angolan shops while fresh meat was "obtained" from Portuguese farms. The Angolan harbour at Lobito provided great quantities of unexpected luxuries in toiletries, food and drink.[41] During Operation Savannah the SADF's logistical system did not function properly in this theatre of operations.

During COIN operations, as with conventional operations, armoured car patrols were mainly confined to roads.[42] They often had to do sweeping operations to clear roads of mines. This was a painstaking and time-consuming process which slowed down movement. Initially the armour had its own support troops for close protection and mine sweeping. Armour support troops formed part of the SAAC and played a vital role in protecting armour in closed terrain and at choke points. The armour support troops were similar to mechanised infantry platoons. At first they operated with Unimog trucks (protected by sandbags) and then received Buffel mine-protected vehicles for COIN operations. Later the support troops used Ratel-60s. There was one support troop for every armoured squadron and therefore a section for every armoured troop. Unfortunately this concept (which was introduced in the 1970s) was discarded in the early 1980s. Armour therefore became dependent on the South African Infantry and Engineer Corps. As a result marrying-

39 **Ibid**.
40 Correspondence with Lt-Col JLM Jacobs, SO1 Force Structures, SA Army Training Formation, 20 September 2006.
41 Correspondence with Gildenhuys, 1 September 2006.
42 **Ibid**.

up training and drills had to be done every time armour elements were attached to new groupings. The phasing out of armour support troops reduced the flexibility of armour to operate more independently when required.

Armour squadrons were attached to different units or bases mainly in the northern part of SWA/Namibia and relatively close to the Angolan border. In total there were at least two armoured car squadrons and one troop deployed throughout the conflict. In the central part of this border area, armour was deployed at Oshakati (10 Armoured Car Regiment) and Ondangwa/Etale (Ovamboland).[43] South of these deployments was an armoured car squadron with 61 Mechanised Battalion Group (61 Mech) at Omuthiya which later consisted of Ratel-90s. In the east there was a squadron at Rundu (Kavango) at stages, and one at the Caprivi Strip (Katima Mulilo). Towards the west one was deployed at Ruacana. From these bases armoured car troops conducted patrols on a rotational basis for two to three days at a time with an infantry section in support, sleeping in the bush and being on high alert. Armoured squadrons were deployed at different locations near the Angolan border from where they could operate.

The reliance on the Eland illustrated the flexibility of armour for conventional, COIN and OOTW. They destroyed tanks, engaged insurgents and supported other departments. The Eland's mobility, easy maintenance and support troops enabled armoured car elements to operate independently. Armour crews had to overcome difficulties of outdated doctrine, and limited logistics with own initiative.

4. THE INFLUENCE OF ISRAELI TANK DOCTRINE

A watershed in SAAC doctrine and tactics came in 1980, after about a dozen junior officers and senior non-commissioned officers from the School of Amour and 1 SSB had undergone tank troop commander training for approximately five months in Israel.[44] The Israeli Defence Force, having learned valuable, but expensive lessons in modern armoured warfare, offered suitable expertise to the South Africans who also used the Centurion as their main battle tank (MBT). The acquired expertise and skills in armour doctrine and tactics were conveyed and implemented in the SAAC and replaced the archaic British doctrine of World War II. Israeli drills were slightly altered to suit the needs of the SAAC whose course curricula and manuals were updated accordingly. Brig. (Ret) Philip Schalkwyk (who later became a Member of Parliament for the Democratic Alliance), was the Director: Projects at that stage and spearheaded much of the implementation of the tailored Israeli drills and lessons learnt by means of sand model exercises and

43 **Ibid**.
44 **Ibid**.

demonstrations.[45] In practice there was an improvement in commands which became more concise. There was also a stronger and more rigid emphasis on executing drills for various immediate actions with more precision and logical flow. The use of "battle runs" (assault ranges) as a training and evaluation method became more advanced. Flag signals were also introduced for the first time but had limited relevance for the African bush and did not remain a high priority in SAAC doctrine for very long.[46] Israeli tank doctrine had a major influence on South African tank doctrine after the early 1980s.

The Israeli influence was much needed for SAAC tank doctrine. It was, however a mistake to apply Israeli tank drills directly to local armoured car doctrine, which impeded its more independent role to a certain extent.[47] It took some creative armoured car instructors and squadron commanders to develop an appropriate mindset for utilising armoured cars.

5. HIGH INTENSITY OPERATIONS: THE ERA OF THE RATEL

During the early 1980s the SAAC received improved equipment. The Ratel-60s and Ratel-90s were completed.[48] The Ratel-90 had the same turret as the Eland-90, performed as well against tanks and was mechanically more reliable. The Centurion tanks were upgraded in 1981 and became known as the Olifant. In 1983, the Olifant Mk 1A was completed with improved sights for night fighting and the first training on these tanks started in 1985.[49] The improvements of SAAC armoured vehicles came just in time for the conventional build-up in Angola towards 1987.

Prior to the deployment of tanks, armoured cars played a supporting role for mechanised infantry-based combat groups.[50] An armoured car squadron consisting of Ratel-90s was first deployed with 61 Mech. Later armoured cars were also attached to motorised and other mechanised infantry battalions as part of combat groups.[51] Mechanised infantry battalions such as 61 Mech had a generic Ratel-90 infantry anti-tank platoon of 12 vehicles, as well as other supporting elements. The Ratels of the infantry anti-tank platoon were sometimes used to reinforce an armour squadron or to fulfil similar tasks. 61 Mech was well organised and well trained and it also developed its own standard operating procedures and techniques which made important contributions in the development of armour doctrine and tactics.

45 Correspondence with Carroll, 4 September 2006.
46 Correspondence with Venter, 15 August 2006.
47 Correspondence with Gildenhuy, 1 September 2006.
48 Heitman, **The South African war machine**, p. 39.
49 **Pantseroperasies**, pp. 1-9.
50 F Bridgeland, **The war for Africa: Twelve months that transformed a continent** (Ashanti: Gibraltar), p. 322.
51 Heitman, **War in Angola**, **the final South African phase**, pp. 74-5.

The armoured cars were well integrated with other subunits, especially the Ratel-20s of the mechanised infantry.

The Ratel-90 stood higher than the Eland and provided better all-round observation in the bush.[52] Crew commanders and gunners also had extended and better sight on targets during engagements. The Ratel-90's height, however, counted against it in dense bush when facing ambushes consisting of FAPLA tanks (which had lower profiles). Usually it was the Ratel-90 drivers in the lower part of the vehicle, who saw the tanks first. It therefore became necessary to train Ratel-90 drivers in giving target indications to the rest of the crew. The Ratel-90's height provided good all-round observation, but armoured car crews had to change their drills to compensate for spotting and engaging the lower FAPLA tanks in dense bush.

The Ratel was very reliable and gave few technical problems.[53] Many technical problems, however, occurred as a result of damage sustained during movement through the bush. Gun recoils, traverse gears and antennas were often damaged by tree branches. Like most wheeled vehicles, the Ratel-90s struggled with mobility at objectives with trenches and often got stuck which required recovery vehicles to come forward and during battle close artillery support was needed to pull them out.[54]

It was impossible to keep sight of all armoured vehicles in a formation.[55] The poor visibility through the bush complicated command and control, as well as navigation. In the process tactical formations often got lost. During the Battle of the Lomba against 47 Brigade on 16 September 1987, Commandant "Bok" Smit, the Commander of Combat Group A, had to stop his attack and locate one of his combat teams which got lost on its way towards the objective.[56] Smit's forces also got mixed up with FAPLA forces and were forced to withdraw that day. Vehicles had to move close together and tactical commanders often had to lead from or close to the front to know what was going on during engagements which placed them in harm's way. Several commanders had to fight from their own Ratels to defend themselves. The limited visibility placed an enormous limitation on command and control, navigation and tactical manoeuvre and made most engagements of battles set-piece in nature, rather than quick and fluid.

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52 Correspondence with Lt-Col (Ret) H Nortmann, 4 September 2006.
53 Correspondence with WO1 K De Ridder, Support Squadron Warrant Officer, 1 SA Tank Regiment, 8 September 2006.
54 Heitman, **War in Angola**, **the final South African phase**, p. 58.
55 JM Dippenaar, "Armour in the African environment" in JK Cilliers and B Sass (eds), "Mailed fist; developments in modern armour, **Institute for Defence Policy Monograph** (Institute for Defence Policy, Halfway House), No. 2, March 1996, p. 45.
56 Heitman, **War in Angola**, **the final South African phase**, p. 63.

Accurate intelligence was crucial to the armour who often had to lead an advance or attack. While Special Forces and intercepted FAPLA signals could not always provide the required intelligence, the armour often had to use Ratel-90 troop patrols to obtain up-to-date intelligence about the terrain and FAPLA's movements.[57] The armoured car squadrons often had to obtain their own intelligence.

During an advance or attack, the Ratel-90 armoured car squadrons were often split up in troops and used as flank guards for a battalion from where they could be brought forward to flank an opponent or reinforce forward elements.[58] The Ratel-90 was primarily used in an anti-tank role and to provide direct fire support to the infantry. The Ratel-90s usually initiated contact with the opposing force and then fought through the objective with mechanised infantry. They had a measure of shock action and FAPLA often referred to the Ratel-90s as "tanks".[59] They were also often utilised in blocking positions over fronts of up to ten kilometres to prevent FAPLA brigades from linking up. Maj. Hannes Nortmann's anti-tank squadron from 32 Battalion with three infantry companies was used to block the movement of FAPLA forces around the source of the Mianei River, getting involved in close night fighting.[60]

At the end of 1986, the military planners foresaw a prominent role for the Ratel-ZT3 (ZT3) system, as part of a strengthened 32 Battalion, which according to plans, was supposed to stop the whole armour-heavy FAPLA advance on the UNITA strongholds.[61]

Nortmann's anti-tank squadron consisted of a troop of four ZT3s armed with anti-tank missiles, as well as a squadron of Ratel-90s.[62] A few spare Ratel-90s were always taken along.[63] The anti-tank squadron formed part of 32 Battalion's Support Group which was under the command of Commandant Robbie Hartslief who later became Combat Group Bravo during Operation Modular. Nortmann had the foresight and the leeway to integrate riflemen of 32 Battalion into the armour squadron to provide constant, integrated infantry protection to the armoured vehicles and they were transported inside the Ratel-90s.[64] This was similar to the old SAAC concept of having an armour support troop as a generic part of armour subunits. The use of Ratel-90s in 32 Battalion provided more security to its motorised infantry, as well as firepower which seemed to give them even more courage. The close

57 Correspondence with Nortmann, 4 September 2006.
58 Heitman, **War in Angola**, **the final South African phase**, p. 57.
59 Correspondence with Nortmann, 4 September 2006.
60 Heitman, **War in Angola**, **the final South African phase**, p. 117.
61 Correspondence with Nortmann, 4 September 2006.
62 Breytenbach, p. 245.
63 Correspondence with Nortmann, 4 September 2006.
64 Breytenbach, p. 245.

integration of armour and infantry in 32 Battalion enhanced the flexibility of its armour.

The ZT3 crews were already trained when they arrived at 32 Battalion.[65] Here the ample supply of ZT3 missiles allowed them to be trained further in live firing techniques and do improvised, integrated training with the Ratel-90 squadron. During the integrated training, the Ratel-90s were deployed in front with the ZT3s a bound behind them. The ZT3s then had to link up with them swiftly and engage targets with target identifications from the Ratel-90s. The ZT3s crews received additional gunnery and improvised, integrated training at 32 Battalion.

During Operation Modular, ZT3s were used for the first time in battle and proved to be very effective in dominating open terrain. They were invaluable for the SADF around the banks of the Lomba by preventing FAPLA forces from crossing.[66] Nortmann's ZT3s, with Ratel-90s and a motorised infantry company in support, stopped the crossing of 21 Brigade (FAPLA) on 10 September 1987 near the Lomba-Cunzumbia confluence. They first dislodged a forward infantry battalion which crossed the Lomba to secure the bridgehead and in the process destroyed a BTR-60 armoured personnel carrier. The FAPLA battalion was chased back over the Lomba. FAPLA then applied a standard tactic to support its infantry in retreat. They counter-attacked with tanks, a tactic used with much success against UNITA.[67] As usual UNITA infantry, but also elements of 32 Battalion with the experience that FAPLA tank attacks were usually not stopped, started to retreat. Nortmann's anti-tank squadron halted this tank counter-attack by destroying several tanks. The tanks that were not destroyed by the Ratel-90s were picked off one-by-one by the ZT3s.[68] Only one hit by the ZT3 was required to destroy a tank which exploded with spectacular effect. The success achieved against 21 Brigade's tanks was a good morale boost for UNITA, the SADF infantry and the SADF in general. There was a realisation that FAPLA's tanks could now be destroyed, something which UNITA could not achieve in the past. After this setback against the ZT3s, FAPLA's tanks avoided open terrain and stayed within the thick bushes as far as possible for the rest of the campaign. Nortmann ZT3s and armoured cars played a vital role to prevent FAPLA forces from crossing the Lomba River and to repulse the tank counter-attacks. Here armour was used for mobile defence and also enabled infantry to stay in the fight even when facing FAPLA tanks.

65 Correspondence with Nortmann, 4 September 2006.
66 Heitman, **War in Angola**, **the final South African phase**, p. 345.
67 Breytenbach, p. 248.
68 Correspondence with Nortmann, 4 September 2006.

The ZT3 was designed to destroy tanks at long range, but had limited scope for use in thick bush. Like most other anti-tank missile systems, the ZT3 was further restricted by poor light and weather, dust, dead ground, obstacles, broken terrain and suppressive fire. The ZT3s, like most armoured vehicles, however, had to select their firing positions around river-banks and shonas very carefully to avoid getting stuck in the flood plains.[69] The ZT3 had limited utility in dense bush and therefore saw little action after FAPLA had been driven far north of the Lomba. Thanks to their good range and penetration, the ZT3s also had a shock effect on FAPLA forces with the spectacular and disastrous kills they inflicted on tanks.[70]

The ZT3 was still in its developmental phases when employed in Angola and therefore technical problems with the missiles were not uncommon.[71] Some missiles flew into the ground, while others lost control in flight. The other big problem was that the missile could not be utilised over short ranges. The first ZT3 onboard systems also struggled with serviceability levels and at one stage Nortmann only had one of the four ZT3s firing.[72] The technical support for the ZT3s were relatively good under the circumstances.[73] When some of the systems became faulty during Operation Modular, Kentron's technicians were flown in from Pretoria to do repair work.

Despite the value of the ZT3, the Ratel-90 proved to be more flexible, especially at closer engagements. During the Battle of the Lomba on 3 October 1987, the armoured squadron (C-squadron) of 61 Mech led the attack on FAPLA's 47 Brigade.[74] During this intensive battle, C-squadron destroyed at least five tanks and inflicted severe casualties which aided in the destruction of 47 Brigade. C-squadron's Ratel 90's fired so many shots that they had to break contact to replenish ammunition and attend to their vehicles and particularly the overworked recoils of the main weapons. Initially the Ratel-90s were mainly used to destroy FAPLA tanks at close range.

The Ratel-90's low-pressure gun and anti-tank round were inadequate to deal with the FAPLA tanks and usually required several hits before destroying a tank.[75] During the Battle of the Lomba, a FAPLA tank was hit eight times before it was knocked out.[76] On average the destruction of a tank took four to six hits. Ratel-90 troop commanders therefore had to concentrate the fire of all their Ratels to destroy

69 Breytenbach, p. 247.
70 Correspondence with Retief, 22 August 2006.
71 Correspondence with Nortmann, 4 September 2006.
72 Breytenbach, p. 249.
73 Correspondence with Nortmann, 4 September 2006.
74 Heitman, **War in Angola**, **the final South African phase**, pp. 75-6.
75 **Ibid**, p. 345.
76 **Ibid**, pp. 75-8.

a tank as soon as possible. Some of the anti-tank rounds from France tended to "splash" against opposing tanks without detonating the round.[77] This problem was later rectified when new ammunition batches were delivered. The Ratel, designed as an armoured personnel carrier only provided protection against small-arms fire and was very vulnerable to bomb fragments, as well as tank and anti-aircraft (ZU-23-type) gunfire. This vulnerability further required Ratel-90 crews to react quickly during engagements. Armoured car troop commanders had to concentrate their fire to compensate for the poor penetration of their main weapons and the limited armour protection of their vehicles.

Since the introduction of Ratels in the early 1980s, the SADF was able to conduct more intensive operations. At this stage doctrine development became closely linked with mechanised doctrine as armoured car squadrons formed part of mechanised infantry battalion groups. This close integration of armour and other service weapons enabled the SADF to conduct a mobile defence during Operation Modular at the Lomba River. The dense bush restricted sight, command and control, and manoeuvre which created pitched battles and the linear deployment of armour. Despite its lack of armour protection, the ZT3 performed well in the anti-tank role while Ratel-90s often led attacks both of which enabled SADF and UNITA infantry to keep contact with FAPLA even when they used tanks. The limited firepower of the Ratel-90 compelled troop commanders to concentrate their vehicles and firepower.

6. THE COMMITMENT OF TANKS: THE ROLE OF THE OLIFANT

The decision to employ the first tank squadron (E-squadron) as part of Operation Modular was an interesting story and became a bit of a bush legend. Shortly after the destruction of FAPLA's 47 Brigade, the South African State President, Mr PW Botha, flew to Angola and was briefed on the operations at Mavinga (UNITA's base and the SADF's Brigade Administrative Area at that stage).[78] While the problems of FAPLA's armour were mentioned, Botha asked with much exasperation why the Olifant tanks (which had cost so much money to upgrade) were not committed. It appears that the SADF did not expect that tanks would ever be authorised for employment given the nature of the diplomatic restrictions the SADF forces were already submitted to, in order to prevent conflict escalation. While the preparation of a tank squadron had been authorised earlier by the Chief of the Army, Lt. Gen. Kat Liebenberg, Botha's argument gave impetus for the offensive use of the Olifant tanks north of the Lomba River in Angola. Later another tank

77 Correspondence with Jacobs, 20 September 2006.
78 Correspondence with Smit, 5 September 2006.

squadron was committed to form part of 61 Mech. The SADF only committed tanks in Angola after Botha indicated the political will for their use.

E-squadron was formed from personnel of the School of Armour, many of whom had to be called back from other duties outside the School.[79] E-squadron had linked up with 4 South African Infantry Battalion (4 SAI) and had completed their training at the Army Battle School (now the Combat Training Centre), before the tanks moved to Angola on 15 October 1987.

The deployment of tanks in Operation Modular with 4 SAI (which also had an armoured car squadron and an anti-tank platoon), provided the SADF with the strongest combat group at that stage and the ability to engage FAPLA forces more directly.[80] When E-squadron fought closely with infantry, they did so with D-Company of 32 Battalion. [81] These two subunits fought together until E-squadron was relieved.

South African tanks saw their first action (since World War II) in Angola on 9 November 1987, at the Chambinga River against elements of 16 FAPLA Brigade, where several FAPLA tanks were destroyed.[82] The tank squadron under command of Maj Andre Retief had sufficient time to prepare for Operation Modular. This enabled E-squadron to execute its missions "by the book". Recordings of the squadron's radio net during engagements indicated the calmness and correctness of procedures followed by the commanders. Individual engagements with FAPLA tanks, however, went hand in hand with much panic among the Olifant tank crews.[83] According to Dippenaar, the South African armoured crews suffered few casualties against FAPLA armour and anti-tank weapons in Angola due to their superior training in reaction times, fire orders and drills.[84] This may explain why no Olifant tank was destroyed by a FAPLA tank. The Olifant tank crews were well trained and outperformed their opponents.

Prior to the deployment of the Olifant tanks in Angola, armour merely supported the mechanised infantry.[85] Soon it became clear that the tank was the most effective armoured fighting vehicle in the bush which in theory suited infantry operations better. The use of the Olifant tank with its armour (that was never penetrated during the war), in general reduced casualties and gave tanks a more prominent role than

79 Heitman, **War in Angola**, **the final South African phase**, p 111.
80 **Ibid**, p. 114.
81 **Ibid**, p. 127.
82 **Ibid**, pp. 123-5.
83 Correspondence with Retief, 22 August 2006.
84 Dippenaar, p. 44.
85 Bridgeland, p. 322.

mechanised infantry. According to Col Louw, the close engagements with FAPLA made SADF mechanised infantry only useful once the armour ensured a FAPLA retreat.[86] In the few cases where mechanised infantry led an attack and dismounted in thick bush, they usually suffered heavy casualties from FAPLA artillery and mortar fire. Tanks enhanced the chances of success and created a psychological effect on opponents by being heard in the bush, but not always being visible until very close.[87] As soon as tanks were introduced in Angola, they were increasingly being relied upon to limit casualties and to achieve overall success in battle.

During the advance to contact which was usually at night to avoid air attacks, tanks usually led an assault group in line-ahead formation.[88] The attacks generally commenced at first light with tanks leading in columns until the expected line of contact was neared. Tanks then usually formed up in a two-up formation (two troops in front and one in depth) followed by the mechanised infantry usually in columns behind the tanks. These respective formations were the easiest way for armour and mechanised infantry to change direction in an attack. In cases where UNITA's infantry supported a tank squadron, they drove into battle on the tanks which exposed them severely to indirect fire. The infantry usually joined the attack close to the opponent's defensive positions. When tanks led the approach route of a combat group, the available armoured cars usually covered the flanks.[89] The Olifant displayed good critical mobility in the soft sand of Angola and from the beginning the tanks had to break the bush for the rest of the 4 SAI combat group.[90] The tank hulls and equipment bins took a heavy toll as they led the advance through the bush.[91] Tank drivers were inexperienced with driving in thick bush which resulted in slow advances in the early stages of the tanks' commitment to Modular and they travelled at 3-5km/h through soft sand and dense vegetation in Angola.[92] Tanks usually led an attack while the armoured cars covered their flanks.

Tanks were also used to counter flank attacks and overrun static gun, mortar and artillery positions.[93] The tactical manoeuvring of tank squadrons in the thick bush was difficult. The engagement ranges were very close and usually between 50-100m at which the tanks' fire control systems had little advantage.

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86 Correspondence with Col GM Louw, Officer Commanding 3 South African Infantry Battalion, 3 September 2006.
87 **Ibid**.
88 **Ibid**.
89 Heitman, **War in Angola**, **the final South African phase**, p. 135.
90 **Ibid**, p. 111.
91 Correspondence with Retief, 22 August 2006.
92 Dippenaar, p. 45.
93 Heitman, **War in Angola**, **the final South African phase**, pp. 124-8.

Armour crew commanders struggled to see approaching FAPLA vehicles. Some tank crews from the School of Armour were able to identify the presence and general direction of FAPLA tanks by the noise of their engines and tracks.[94] This natural skill was picked up informally at the School of Armour where a captured T-55 tank was often tested. When the crews heard the familiar sound, their memories kicked in. Speculative fire into the bushes was therefore "instinctive" and contributed to several FAPLA tank kills by South African tank crew commanders rather than their gunners. With night fighting in the dense bush the engagement range came as close as 50 meters, during which indirect fire support played an important role to keep FAPLA forces at bay. It was difficult to spot FAPLA armoured vehicles in the bush and therefore armour crews often used speculative fire to engage them.

The Olifant tank proved to be very reliable with the standard and very intensive maintenance by its crews.[95] They also provided good protection to crews and absorbed battle damage quite adequately. The 105mm gun of the Olifant performed well against the T-55s and its anti-tank rounds penetrated their armour with ease.[96]

Mines were probably the biggest enemy of the Olifant tank in Angola. When an Olifant hit an anti-tank mine, it was almost always immobilised. The soft sand in Angola made the recovery of tanks very difficult.[97] Consequently mines could hinder the mobility of a whole combat group and the less-than-reliable *Plofadder* de-mining explosive cord (at that stage), made minefields a bigger nuisance for SADF forces. The SADF abandoned three tanks which hit mines near Tumpo on 23 March 1988, after a decision at higher headquarters had been made not to destroy them, but to recover them later - which was never achieved.

The tank squadron took enough technical personnel and spares for a whole tank regiment, but still faced several logistical and technical challenges.[98] The technical crews of the armoured recovery vehicles (ARVs) served meritoriously and did repair work on tanks under difficult situations and often while drawing small arms fire. While a lot of spares were taken along, further spares became a huge problem in terms of weight. The tank tracks became stretched after a few hundred kilometres and had to be changed. The soft-skinned logistical vehicles (Samil-100s) struggled to carry such heavy loads off-road for the more than 350 kilometers from logistical bases and therefore all the tracks could not be delivered. In the end only track-pins were brought, because these started to look like camshafts. This exercise

94 **Ibid**, pp. 114-7.
95 **Ibid**, p. 345.
96 **Ibid**, p. 128.
97 Correspondence with Louw, 3 September 2006.
98 Correspondence with Retief, 22 August 2006.

was very hard work for the crews, like most maintenance tasks on a tank. The logistical problems occurred through misunderstandings and lack of expertise with requests for specific spares and items. The tanks did not use a lot of main weapon ammunition, but their diesel consumption was extremely high. The maintenance of tanks required extensive logistical and technical support which presented several problems.

The commitment of SADF tanks in Angola required political will at the highest level. The use of tanks enabled the SADF to change from mobile defence operations at the Lomba to more offensive operations towards Cuito Cuanavale. As with other AFVs, the dense vegetation put a lot of strain on the tanks in Angola which required intensive maintenance and logistic support. The vegetation further caused very close engagements with FAPLA tanks, but the superior training of the SAAC tank crews paid dividends as no Olifant was knocked out. The use of tanks reduced SADF casualties in general and the SADF relied increasingly on the Olifants for overall mission success as they led battalions into battle with armoured cars covering their flanks.

7. THE CONVENTIONAL ROLE OF SOUTH AFRICAN ARMOUR IN RETROSPECT

South African armour was almost always deployed in single squadrons and in some cases two squadrons where a tank and armoured car squadron were in the same grouping.[99] There is no example where a whole armour regiment was grouped or employed. The largest armour formation in Angola was used during the third attack on Tumpo on 22 March 1988.[100] Regiment President Steyn, a Reserve Force regiment under command of Commandant Gerhard Louw, consisting of two Olifant tank squadrons, was deployed with the expectation that the attack would be led by a full tank regiment. South African armour was usually deployed in single squadrons as part of a battalion group, but never as an armoured regiment.

The tendency to deploy only one armour squadron as the largest armour component raises the question whether armoured regiments might not have been more effective. In hindsight, most armour officers are of the opinion that the employment of whole armoured regiments would not necessarily have produced more decisive results. There are two arguments in this regard. Firstly, the dense vegetation prevented the effective manoeuvring of an armoured regiment.[101] Secondly, the composition and deployment of FAPLA forces did, however, not justify the use of

99 Heitman, **War in Angola**, **the final South African phase**, p. 120.
100 Bridgeland, pp. 322-3.
101 Correspondence with Retief, 22 August 2006.

independent armour regiments.[102] It is argued that the need to strengthen infantry battalions (combat group) and infantry companies (combat team) with armour squadrons and troops respectively, provided sufficient firepower, mobility and protection to form balanced all-arms capabilities to combined forces. On the other hand there are those who argue that the use of full armoured regiments would have given commanders more options.[103] The use of full-strength armoured regiments would also have provided more momentum for an attack, because then a squadron or two could have been used as a mobile reserve for exploitation operations. South African armour squadrons often had to replenish after clashes with FAPLA and could not always pursue them. In theory regiments would have been advantageous; however, there was doubt about the SADF's logistical system and its ability to support one or more armoured regiments.

Although an operational level consideration, the question might also be asked why armour-heavy SADF forces were never utilised to threaten FAPLA's logistical bases and communication lines west of the Cuito River. There were several constraints in this regard. Firstly, the option of occupying towns in Angola (such as the FAPLA logistical base at Menongue), was probably not considered as this could have resulted in serious diplomatic problems.[104] Secondly, SADF casualties were unacceptable to the South African public and was a further limitation. While the operational aim was only to prevent FAPLA from launching another offensive over the Cuito River in 1988, there was no need to destroy all FAPLA forces. Thirdly, the SADF did not have sufficient logistical capabilities to operate on long exterior lines of communication to threaten FAPLA's operational depth.[105] Political constraints and limited resources prevented the SADF from employing armour-heavy formations west of the Cuito River to threaten FAPLA's depth.

With the option of sending a western manoeuvre force around FAPLA's main force ruled out, the SADF still had the options of flank attacks and envelopments on individual brigades at the tactical level. Despite the attack on 16 FAPLA Brigade from the northeast on 9 November 1987, the SADF struggled to succeed in concentrating different combat groups for flank attacks.[106] The SADF only had three combat groups facing at least four FAPLA brigades at a time, which made the South Africans cautious. An attack on one FAPLA brigade required the prevention of other brigades from interfering or linking-up and then a reserve element still had to be maintained. The SADF further struggled with identifying friend from foe in the bush. The SADF's inability to concentrate its forces allowed several FAPLA

102 Correspondence with Gildenhuys, 1 September 2006.
103 Correspondence with Nortmann, 4 September 2006.
104 Correspondence with Louw, 3 September 2006.
105 Interview with Col (Ret) R. Hartslief, 8 August 2000.
106 Correspondence with Retief, 22 August 2006.

brigades to escape over or around the Chambinga River without being cut off; therefore most SADF attacks north of the Lomba River were merely frontal probes with armour leading the attack and which gradually pushed FAPLA forces north-west towards Cuito Cuanavale, leading to a stalemate situation. The inability of the SADF to manoeuvre resulted in the linear deployment of SADF forces with armour at the front.

The military stalemate at Cuito Cuanavale became a turning-point in the Angola and SWA/Namibia conflict. In May 1988, talks aimed at ending hostilities between Angola, Cuba and South Africa commenced. These talks were facilitated by the United States and the Soviet Union and succeeded at the end of that year.

8. DE-MINING OPERATIONS

A less well-known role of armour in SWA/Namibia was to support the de-mining tasks of the engineers in February 1989. Towards the end of the conflict the need developed to commence with de-mining operations around the SADF bases that had been demobilised, particularly the northern bases.[107]

On request of the engineers one of the spare Olifant tanks (with the usual call-sign "sierra") with mine rollers was made available to assist with de-mining. (Each tank squadron had a spare tank to replace another tank at any stage during an operation). This tank drove around the outside areas of bases where the mines, varying from only anti-personnel to a mix with anti-tank mines had been laid. The maps for this operation were very accurate, but the ground surface changed over time which presented several problems. The shifting of sand and the build-up of sand often required that the mine rollers had to be adjusted to a deeper depth. For this purpose an additional roller was mounted to the rear of the tank. The tank crew had to be rotated on a weekly basis for obvious occupational health reasons. The use of the tank saved the engineers a lot of manpower and probably months of work.

9. APRIL FOOL'S DAY

On 22 December 1988, an agreement between South Africa and Angola was signed in New York which would give independence to Namibia.[108] The United Nations Resolution 435 was to be implemented on 1 April 1989 which made provision for the South Africans to withdraw their administration and military presence and to hand over power to the Namibians with the assistance of the United Nations Transi-

[107] Correspondence with Carroll, 4 September 2006.
[108] P Stiff, **Nine days of war. Namibia - before, during and after** (Lemur Books, Alberton, 1991), p. 49.

tion Assistance Group (UNTAG). Elections were scheduled for November 1989. SWAPO which had not signed any agreement leading to the ceasefire, was not interested in elections and prepared to grab power with military force. SWAPO's forces were deployed south of the 16th parallel in contravention of the agreement and Angola failed to enforce this upon SWAPO. More than 1 600 PLAN (People's Liberation Army of Namibia) fighters armed with, among others, anti-tank and anti-aircraft weapons, massed on the Namibian border in Angola and on the night of 31 March 1989, they launched attacks into Namibia to subvert the elections.[109]

By the end of March 1989, the SADF presence had been scaled down and units were confined to their bases in Namibia as agreed.[110] The SWA/Namibia police (Koevoet), which was now only armed with small arms, still conducted patrols. Some minor SWAPO infiltrations had occurred earlier but the SADF had not been involved.

The downscaling of the SADF forces and their support elements impacted significantly on the remaining armour subunits and most of the latter were demobilised.[111] Spares for armoured vehicles were scarce and therefore Ratel-90 armoured car troops now often consisted of only three vehicles instead of four, as some Ratels were cannibalised for spares. The squadron echelons were also downscaled. Technical support was centralised and therefore limited. The recoils of some Ratel-90s, for example, did not work. On the eve of the SWAPO massed attacks, the SADF armour was unprepared.

When the SWAPO attacks commenced on 1 April 1989, there was an initial response of unbelief and it also took many hours to mobilise the SADF forces.[112] Initially armoured cars were deployed as squadrons with infantry battalions and some were detached to Koevoet. Later the squadrons were broken up into troops with combat teams as the situation became clearer. The missions conducted during this phase were typical COIN operations in co-operation with trackers. When a track was found, a pursuit would follow to destroy or arrest the SWAPO elements. The Aloutte helicopter gunships that took part in pursuits were given target indications by armoured cars.

The SWAPO forces attacked in larger groupings and were more heavily armed than ever before.[113] Tracks were found of groups of up to 50 men. Some groups dispersed when pursued while others laid ambushes. Anti-tank weapons such as RPG-

109 **Ibid**, p. 7.
110 Correspondence with De Ridder, 8 September 2006.
111 **Ibid**.
112 **Ibid**.
113 **Ibid**.

7s were carried in large numbers. Some of the most intense fights in the history of the SWA/Namibia conflict took place in the first two weeks of April 1989 in which Koevoet suffered more casualties than ever before. The South African armour took part in the operations in northern Ovamboland where sight was often restricted to 10 or 15 meters and very close engagements ensued. SWAPO suffered heavy casualties and according to some SADF accounts, some Ratel-90s ran out of canister rounds. During these clashes one Ratel-90 was shot out by two RPG-7s, with one crew member injured. During another engagement an armoured car troop commander was killed. SWAPO attacked in large groups which resulted in some of the most violent clashes during the SWA/Namibia conflict before the offensive was stopped. In November 1989, the elections in Namibia produced a landslide victory for SWAPO[114] and Namibia became independent on 21 March 1990.

The SADF and the SAAC were unprepared for the SWAPO offensive of 1989. The lesson here is that a downscaling in the size of a military force does not mean that it must be downscaled in terms of quality or ability to keep on operating.

10. THE DEVELOPMENT OF ARMOUR DOCTRINE

South African armour doctrine is deeply rooted in British post-World War II armour doctrine which was largely adopted by the SAAC and further developed to suit own requirements.[115] The first command cadre of the School of Armour did significant doctrine development work to expand on British doctrine after 1966. This work was continued by amongst others Col (Ret) Hans Kriek in later years. Kriek wrote much about armour doctrine in general since he was a captain.[116] During the 1970s and 1980s, he also made notable contributions towards concepts for high mobility and high intensity operations. With the implementation of Israeli tank doctrine in the early 1980s, Colonels (Ret) Mike Muller and CP du Toit largely rewrote SAAC troop handling doctrine. Du Toit further made a significant contribution with his emphasis on manoeuvre at 61 Mech and with the development of armour doctrine and training videos at the School of Armour. Muller and Maj. Gen. (Ret) JM Dippenaar, who were founding members of 61 Mech, contributed much towards armoured car tactics and doctrine. They drafted several standard operating procedures (SOPs) which became the cornerstone of mechanised and armour doctrine of the SADF. Maj. Gen. (Ret) Wouter Lombaard and Brig. (Ret) Fido Smit contributed much towards the designing, development and production of armour systems which also involved further development of armour doctrine.

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114 Van Aswegen, p. 305.
115 Correspondence with Col A Retief, South African Defence Attaché to Egypt and Jordan, 17 October 2006.
116 Correspondence with Gildenhuys, 1 September 2006.

While the SAAC had an abundance of armour doctrine manuals, SOPs and check lists, few theoretical works on the development of South African armour doctrine are available or have been published. The scarcity of academic-type writing about armour doctrine may be attributed to the fact that theoretical work never found much accommodation in the careers of SADF officers. The SADF élite did not consider the writing of articles, or the study and development of military theory all that important.[117] Perhaps that is why their published contributions in this regard were few and far between. Military experience traditionally counted more than staff or intellectual ability in the South African military. Military thinkers were also not really rewarded.

Maj. Gen. (Ret) Roland de Vries, a mechanised infantrymen, made some of the most well-known contributions towards ideas of mobile warfare in South Africa in his book **Mobiele Oorlogvoering** (1987).[118] De Vries continued much of the work started by Dippenaar. He highlighted the characteristics of manoeuvre theory and particularly mobile warfare which were applied by the SADF during conventional operations in Angola during the late 1980s.[119] Some of these mobile warfare characteristics were: offensive operations, the constant movement of forces, surprise of the opponent, controlled concentration and dispersion, no clear fronts, the flexible use of forces and the destruction of the opponent instead of occupying ground.

The development of South African armour doctrine during the SWA/Namibia conflict was closely related to developments in mobile warfare and specifically mechanised doctrine, mainly because the SA Army was and still is an infantry-based force and because armour was used in support of infantry. The SOPs for armour as part of infantry battalion groups became a prominent influence in the way armour was employed during the 1970s and 1980s.

11. CONCLUSION

The development of tanks introduced the role of cavalry (armour) to the modern battlefield. Armour has an exceptional combination of firepower, protection and mobility which enables it to manoeuvre, attack, or counter-attack. Armour further has the unique ability to produce shock action which distinguishes it from other mounted forces. Like most other service weapons, armour functions more effectively as part of a combined arms system. South Africa's experience was no exception.

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117 A Seegers, **The military in the making of South Africa** (Tauris Academic Studies, London, 1996), p. 141.

118 R de Vries, **Mobiele oorlogvoering, 'n perspektief vir Suider-Afrika** (FJN Harman Uitgewers, Menlopark, 1987).

119 **Ibid**, pp. 136-7.

Armour enabled South Africa to take part in high intensity operations, but always with some form of close infantry support, and when available, indirect fire as well.

The 1950s and 1960s were periods of consolidation for the SADF during which new tanks and armoured cars were acquired. Since the SWA/Namibia conflict had started, different AFVs were relied upon in consecutive stages by the SADF.

The era of the Eland indicated the potential of armour to operate independently with support troops, as well as its flexibility and collateral value in conventional, COIN and OOTW roles. They were used successfully against tanks despite the high risk.

The commissioning of the Ratel was accompanied by the much-needed improvement of armour doctrine based on Israeli tank training. This development improved the commands, drills, training and evaluation of the armour, but became too influential in armoured car doctrine. Armour doctrine also became closely linked to mechanised doctrine as armoured car squadrons formed part of mechanised battalions. The contribution of most SADF officers towards armour doctrine was focussed on supporting mechanised battalions such as 61 Mech. The Ratel enabled the SADF to execute more intensive mobile operations and with close integration with infantry and artillery, the SADF conducted mobile defence operations against FAPLA near the Lomba River in Angola. Here armour blocked the movement of FAPLA forces and stopped tank counter-attacks while allowing infantry to stay in the battle. The Ratel-90 displayed much flexibility and concentration of force at close range, while the ZT3 inflicted much damage on tanks at longer ranges.

The deployment of tanks in Angola required high-level political will which allowed the SADF and UNITA to engage FAPLA forces more directly and aggressively on the tactical level. The use of tanks and their well-trained crews gave armour an increasingly prominent role to achieve success, reduce casualties and to spearhead attacks which made it possible for the SADF to push FAPLA back north towards Cuito Cuanavale. Here a stalemate situation developed which led to peace talks. Towards the end of the SWA/Namibia conflict armour was used in de-mining operations, as well as to halt massed SWAPO attacks.

During the SWA/Namibia conflict, the SAAC applied armour almost entirely as squadrons in support of infantry and not as individual regiments. The use of armoured squadrons instead of regiments suited the SADF's needs to support infantry battalions as part of the combined arms system, but deprived it of the ability to exploit success after a battle. It also restricted the SADF's ability to manoeuvre, flank and envelop.

South African armour doctrine originates from post-World War II British armour doctrine which was further developed for the SAAC's needs. The incorporation of Israeli tank doctrine rejuvenated the outdated British-based SAAC doctrine in the 1980s. The SOPs developed by commanders of mechanised infantry battalion groups and their armour squadron commanders also enhanced armour doctrine development specifically for the SWA/Namibia conflict. Those involved with the development of new armour systems also made notable contributions. The work of De Vries[120] laid an important framework for the role of armour in mobile operations.

120 See foot-note 118.