

## OPERATOR INFORMATION

**Lt Col Anders Silver probably has one of the most interesting tasks in the Swedish Air Force today. As Commanding Officer of the Operational Test & Evaluation (OT&E) unit Gripen he can shape how a fourth generation air force will operate in the future. As a key team player in the first Air Force to operate a fourth generation aircraft Lt Col Silver gave this presentation to a captivated audience at the Shepard Air Power Conference in London.**

The SwAF defines three main roles. Air to air, air to ground and reconnaissance. All Gripen aircraft can take on all three roles and the pilots are trained to perform all types of missions. We have seen a lot of spin-offs from one role to the other which creates synergistic effects and saves flying hours. The excellent man-machine interface, the use of simulators and the mentioned synergistic effect are key factors in enabling one pilot to perform in three roles. In my view Gripen has definitely met the expectations and is today confirmed as an operational true multi-role fighter.

Multi-role operations have substantially changed the way pilots think about air power. Instead of focusing on a single role the pilots look upon their mission from the view of the commander.

– How can he best achieve the aim of the task with the sensors and armament carried? That is the question that guide his actions. Air Power doctrine seems to finally have made its way to the cockpit.

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Katsuhiko Tokunaga



Pia Eriksson, FMV

## Gripen first lady

**Birgitta Böhlin, General Director of the Swedish Defense Material Administration, FMV, became the first woman to fly Gripen. “I understand why everybody who has had the privilege to fly Gripen is impressed. This was a big experience that gives me some insight in the qualities of our new fighter” was her first comments after touch down in a two-seat Gripen at FMV test-center Malmen.**

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Since the beginning of this century Swedish industry has spawned international majors such as Ericsson, ABB and Astra to name but a few. In spite of being a country with a small population many Swedish companies have achieved great success in the international marketplace. These success stories are based on an innovative high-tech tradition backed by long-term active ownership not least in the Wallenberg sphere of companies. Investor, Wallenberg's investment vehicle, has always been Saab's main owner today, together with British Aerospace.

Another important element in our background is the Swedish policy of non-alignment. For many years there has been strong support among the Swedish population for the policy of non-alignment in peace time aiming at neutrality in case of war. Geographically situated in between the old superpower blocs the Government's view was that neutrality was the best contribution to stability in our region. One of the effects of this policy has been a need for developing a strong national defence force. The policy of non-alignment cannot be upheld without sufficient industrial resources. Over the years Saab has been an internationally competitive supplier of aircraft and other cost-effective systems to the Swedish armed forces. Thereby we have offered important support to the national security policy.

Gripen is the first of the fourth generation fighters in operational service worldwide. It's an aircraft truly capitalising on the digital technology that its predecessors only partly contained. This is important in many ways.

First the software-based flight control system combined with a relaxed stability aerodynamic design allows greatly improved manoeuvrability. This also significantly relaxes the pilot's workload to fly the aircraft so that he can concentrate on his real task.

Second the aircraft can be updated more easily and at a far lower cost. Gripen will remain "forever young" as its software is gradually updated.

Gripen is a good example of what international co-operation means in this business. The aircraft itself is the re-



Terbjörn Casperston

**“By working together the European aerospace industries can pack a formidable combined European punch industrially and politically.”**

**At a DESO conference in England recently, Saab CEO Bengt Halse presented the Gripen heritage, present and future.**

sult of the expertise of many companies in many countries. To reduce risks and costs we had to look for the most cost competitive suppliers in the world for the different components and subsystems. The result is an aircraft being one third Swedish, one third other European and one third American. Saab's primary role is systems integration making all the subsystems work together. This capability to cooperate internationally will be even more important in the future.

By working together the European aerospace industries can pack a formidable combined European punch both industrially and politically.

Very high on the agenda today is the issue of aerospace and defense consolidation. For Saab the first steps to real consolidation have been taken together with the UK. A major step was the joint venture formed in 1995 with the aim of exporting Gripen. This is not only a matter of selling aircraft. Export success also requires expertise in design, development, marketing, manufacturing and support and indeed also

in politics and industrial offset. To be successful on the international market the product must be adapted to the demands of the countries concerned. Our partner British Aerospace has been instrumental in this work.

The integration in key areas is working well. We use single source production and operations are lead by a joint management team. Our experiences from the exchange of all the way from the Board of Directors to the manufacturing plants are in general very positive.

The Saab and British Aerospace co-operation has scored its first success in South Africa. This deal is not yet done. But South Africa has chosen Gripen and Hawk in head-on competition with other products. I see this as quite impressive proof of our combined strength. Saab is contributing the product itself, the only fourth generation fighter in operational service. This is matched by British Aerospace and DESO's marketing and support resources. The political backing is strong from both Sweden and Britain. Two countries with good relations to South Africa. The financial support from ECDG and its Swedish counterpart is in place.

Finally Saab's access to the Wallenberg sphere of companies and other Swedish based internationals facilitates an extensive programme for industrial co-operation with South Africa. Traditional counter trade offsets typically drop or die after fulfillment. An industrial cooperation program on the other hand based on the premise that every single deal must be commercially viable in itself tends to be self promoting and provides the framework for making the deal very favourable for not only the South African air force but for the country as a whole.

Between us have tremendous clout British Aerospace and DESO with the defence and political community and Saab backed by the Wallenberg group of companies with the industrial and political community. ■

# South African power for Gripen displays

Darren Alexander



Ericsson Saab Avionics president Björn Erman and Avitronics General Manager Ben Ash.

**Avitronics, a leading high-tech company in the Grintek Group of South Africa, has been chosen to develop and manufacture a new power unit for the Gripen's color display system supplied by Ericsson Saab Avionics. This is the first contract awarded since the 1998 South African decision to commence negotiations for the purchase of 28 Gripen fighters for the South African Air Force. At the announcement, Ericsson Saab Avionics President Björn Erman pointed out that Avitronics was selected on its own merits from among a group of international competitors. "Apart from meeting our high requirements," he said, "we also believe Avitronics will be a suitable partner for a long relationship."**

The initial phase of the contract is for Avitronics to develop and produce units for the Swedish Air Force's next batch of 64 Gripens, with the first delivery due in 2003. The value of this initial phase exceeds USD 1 million. The intention is also that Avitronics power

units will equip all Gripens produced for the export market. "This contract confirms that we are successfully internationalizing our business by building on our areas of excellence," says Ben Ash, General Manager of Avitronics. Last year Grintek was also selected to

supply export Gripens with a South African-developed audio management system. This is probably just the start of the South African electronics and defense industries' involvement in Gripen. ■

## Gripen exceeds expectations

**Gripen "performs much better than we required in our specifications. The Swedish program is running well and according to the current plan," says Major General Staffan Näsström, Chief of the Air Force Materiel Command. From the operational side, Colonel Jan Andersson, Commander of F 7 Air Force Wing that has two operational Gripen squadrons, can also see the cost benefits of the fourth-generation aircraft. "We have observed that Gripen's operational cost is considerably lower than that of its predecessor, the Viggen. For example, fuel consumption is 50 percent lower and the cost of scheduled maintenance is approximately 40 percent lower."**

This is the first time that the Swedish Defence Materiel Administration, FMV, has released comparative figures regarding Gripen performance. In the latest issue of FMV's in-house magazine, FMV-aktuellt, Major General Näsström sums up the present status of Gripen in the Swedish Air Force. He starts by saying that he is impressed by the result, and that he can say so with impartiality, taking no credit for this himself since he became involved in the Gripen project only at a late stage. Although detailed figures are classified, several comparisons can be made. While the Air Force looks at the benefits compared with the third-generation Viggen, FMV makes its comparison against the demanding specifications drawn up when it ordered the first fourth-generation aircraft, Gripen.

One of the special features of Swedish combat aircraft, and notably of

both Viggen and Gripen, is the ability to use short or even damaged runways. The results show that Gripen's take-off performance is 28 percent better than specification and landing performance, even on slippery runways, is 17 percent better.

Since the present Gripen in the Swedish Air Force does not have the in-flight refueling system that is offered on the export Gripen, range and patrol time are measured on the basis of the fuel that the aircraft can take off with. While the Air Force is seeing 50 percent lower fuel consumption than for the Viggen, FMV's comparison shows that the specification is bettered by 52 percent on reconnaissance and 47 percent on attack and fighter missions. One final example is the Ericsson PS-05 radar, one of the features that gives the Gripen pilot information superiority. According to FMV, accuracy is 50 per-

Torbjörn Caspersson



Major General Staffan Näsström after his first flight in Gripen.

cent better and range against both air and sea targets is between 15 and 40 percent better than specifications. ■



By Lt Col Anders Silwer, Commanding Officer of the Operational Test & Evaluation (OT&E) unit Gripen, SwAF.



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Swing-role in the SwAF is defined as the ability to use multi-role aircraft in several roles during the same mission. Let me give an example from a recent exercise, a swing-role mission flown by a Gripen four-ship formation during conversion. The first part of the mission was a low level air to ground mission with Dispenser Weapons System against an airbase. The second part was reconnaissance. One aircraft surveyed and tracked ships west of Sweden and sent the information on datalink to the other aircraft. The datalink information enabled them to perform anti-ship warfare without using their own radar. The third part was in the air-to-air role when the fourship acquired and tracked SAAB 105's by radar to practice AMRAAM and Sidewinder engagements on them.

I think that Gripen has met our expectations in swing-role performance and substantially increased the flexibility of Swedish air power.

**Information superiority**

Now we come to a feature which I believe to be the most interesting. Air Power Doctrines declares that one of the characteristics of air power is the dependence on information. This was called "increased operational value" during the Gripen decision process. Gripen can gain information superiority by using datalinks, Mission Support System (MSS) and an intelligent Man Machine Interface (MMI).



Our air force has been committed to datalinks on fighters for three decades. On the Gripen it is further deve-

loped. It communicates between aircraft in the air or on the ground and between aircraft and the command chain. The datalink enhances the situation awareness considerably in a combat area. An example of this is an air defence exercise conducted in mid 1998 in south eastern Sweden and part of the Baltic Sea. In the set up, the aggressors used concentrated attacks with fighter escort and supported by Airborne Early Warning. The defence force was four Gripen. The Gripen datalink gave the leader of the formation the capability to use a wide spread formation on the combat air patrol and yet be able to concentrate the force when the aggressors

were targeted. The fighter controller found that they had a new tool that gave them the opportunity to act rather than react. found the aircraft very easy to land on a roadbase. Another interesting feature is the small visual and radar signature. Gripen is only about 60 % the size of a Viggen or an F-18. And so very hard to acquire and track visually. Thus Gripen has an advantage over bigger aircraft in Within Visual Range (WVR) combat. The small radar signature has the same effect on Beyond Visual Range (BVR) combat.

F. W. Lancaster showed in his theory about "the apparent size of force" that the number of missions flown in the combat area is important for air power. Sweden has for decades had a tradition of stressing fast turn arounds to

squadron was declared operational. The exercise contained 24-hour multi-role mission operations with one squadron for four days. Most of the operations were conducted from ordinary roads. All maintenance and turn around was made under field conditions. Conscripts with no previous experience on the Gripen were trained for only one week on the turnaround of the aircraft. This exercise proved that the "advanced simplicity" made it possible to continue with the Swedish system of conscripts even when servicing multi-role aircraft. It also proved that Gripen fits in to the our concept of dispersed airbases.

Anders Nylen



sors were targeted. The fighter controller found that they had a new tool that gave them the opportunity to act rather than react.

Even though as a fighter pilot I have always been relishing turning and burning situation awareness is the most vital characteristic on the Gripen. It is such a great advantage for all pilots in a unit to be able to check fuel, status, weapons load, heading, altitude, target acquisition, etc. on all aircraft in the unit.

#### **Aircraft performance and characteristics**

Now turning to performance, during operational test and evaluation the Gripen has reached and exceeded specified performance by 5 to 52%. It has a 9G turning performance. Delta wing aircraft usually have high instantaneous turn rate but pay for it in a high induced drag. Gripen has significantly lower induced drag which makes for a very agile fighter. The landing performance is an essential criteria for our concept of dispersed airbases. I have

increase "the apparent size of force". Thus it was a vital objective that Gripen could be rearmed and refuelled quickly. Turn around for a multi-role mission with a is just as fast as for a single role mission with a Viggen.

#### **Low operations cost**

Since the end of the Cold War air power has been limited by decreasing budgets in most countries. But in Sweden we have faced that problem since the seventies. So the transition has in this respect been easier for us. By building a smaller aircraft than the Viggen, the aim was to reduce procurement and maintenance costs. The smaller airframe has resulted in less fuel consumption. A reduction of 50 % compared to Viggen operations. Maintenance costs are also significantly lower. So it may come as no surprise to learn that the air force wants to complete the conversion as soon as possible.

In 1997 a major combat exercise was conducted at a dispersed forest air base as a test before the first Gripen

#### **Gripen programme today in the SwAF**

The situation today is that a total of 204 aircraft have been ordered including 28 fully operational two-seaters. The order is a package containing aircraft, weapon systems, ground support systems, EW-systems, training, overhaul, maintenance, development, modifications and future growth potential.

The Gripen center at the F7 wing is furnished with all facilities required for a centralised operational conversion. The two-seater Gripen will enter the conversion programme by October this year. The conversion will proceed at a pace of two squadrons a year until 2003. Up till now, all pilots converting to Gripen have had fighter experience. In January 2001 pilots with only 200 hours on the SAAB 105 will enter the conversion programme. Today two squadrons are already operational. So, with modesty I have to boast: that the SwAF is the first to operate a fourth generation fighter. ■



FMV General Director Birgitta Böhlin and test pilot Lt Colonel Björn Johansson.

Pia Eriksson, FMV

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This was not the first time in a fighter for MS. Böhlin. She has previous experience from a flight in SK37 Viggen and she is quick to point out that both of these flight required a good level of

physical fitness and there has been no talks about special "ladies-program".

"On both these occasions the pilot has had the confidence in me to let me do some flying myself. The Viggen sortie was more brutal and shaky while

flying Gripen was smoother even though the program itself was as tough. After this I think that I can understand what the "real" pilots mean when they talk about the differences between a third and a fourth generation aircraft.

So what did the "real" pilot think, FMV test pilot Björn Johansson flew with his boss in the Gripen. "This was a normal test-sortie that I had planned. I got a chance to show the flight characteristics like maneuverability and acceleration. We used the radar to track both air and surface targets but I could for obvious reasons not use any weapons.

It was an offer Birgitta Böhlin couldn't refuse when Björn Johansson invited her to Malmen for a trip in Gripen. It was a really valuable experience getting to know Gripen on a first hand basis since Birgitta Böhlin as Director General for FMV meets many colleagues from countries around the world. Even though this is very limited experience, it will give me something special to tell them, says Ms. Böhlin. ■



### Industrialists meet Czech President

A twenty-strong Swedish industrial delegation headed by Investor Honorary Chairman Peter Wallenberg visited the Czech Republic at the end of March. The group was given the opportunity to talk with an impressive number of Czech Government ministers, among them Prime Minister Zeman, Vice Prime Ministers Lánský and Mertlík, Deputy Vice Prime Minister Mládek, the Minister of Defense and the Minister of Industry. They also had the privilege to meet Czech President Vaclav Havel.

According to a Swedish business daily newspaper that covered the trip, Deputy Prime Minister Mertlík stated that industrial co-operation offers will be very important when it comes to determining which combat aircraft will be selected for the Czech Air Force.

The high level of interest among Swedish companies to cooperate with the Czech Republic can be seen in the list of company delegates who took part in the visit. Included on the are senior representatives from, among others, ABB, Atlas-Copco, Electrolux, Ericsson, Saab and Scania. ■

## South African visit to Gripen production

Representatives from the two trade unions National Union of Metalworkers of South Africa and Aerospace Trade Union of South Africa have made a visit to their colleagues at Gripen. Discussions to form closer bonds between the South Africans and their Swedish counterparts were held. Industrial visits were made to the Gripen assembly line and

also to the engine assembly plant at Volvo Aero Corporation. The South Africans also had a chance to see Gripen in action at the F7 air force wing. Now that we have these important contacts we are planning a trip to South African industries said one of the Swedish trade union official at the end of the visit. ■

## M I S C E L L A N Y



### First F 10 pilots fly Gripen

On March 11 pilots from the F 10 Swedish Air Force Wing at Ängelholm were among a group of nine new SAF pilots to fly Gripen for the

first time. F 10 will this year convert one squadron from the Saab Draken to the Gripen. With the introduction of Gripen, the SAF started centralized training with a six-month con-

version course for experienced Draken or Viggen pilots takes place at F 7 before the pilots return to their home base. ■

### Doctor Halse, I presume

Saab CEO Bengt Halse will in June receive an honorary doctorate degree from the University of Linköping, Sweden. Bengt Halse receives the degree for his contribution to the re-

search community and especially for his work with the Excellence Center in Computer Science and Systems Engineering at the university. ■



### Investor Chairman gets Polish Oscar

At a ceremony at the Royal Castle in Warsaw, the President of Poland, Alexander Kwasniewski, awarded "The Polish Business Oscar" to Percy Barnevik, Chairman of Investor AB, which is the principal holding company of the Saab Group. The recipient of this annual award is chosen by the Polish Business Club. The Oscar was awarded to Mr. Barnevik for his contributions "to furthering Poland's efforts to become a member of the European Union and to assume the role of an equal partner in the family of democratic nations." ■



### Swedish Minister visits Brazil

Brazil's first civilian Defense Minister in modern times, Mr. Elcio Alvares, was recently appointed and the first foreign colleague to visit him was Swedish Defense Minister Björn von Sydow, who made an official visit in late March. Apart from meeting Alvares, von Sydow also held talks with several other ministers in the Brazilian Government and met the Speaker of the Brazilian Congress. ■

# Summer in Europe

**There will be several “for the first time ever” occasions for Gripen during the European air show season this summer, the first being the last weekend in May when the Swedish Air Force visits the US Air Force base at RAF Mildenhall in Suffolk.**

It will be a short stop at home at F7 before the new SAF Gripen display pilot, Major Martin Birkfeldt, heads off to Norway and the Bodö Air Base, beautifully situated just north of the Arctic Circle. NATO's 50th anniversary is an important theme and this is expected to be the largest air show ever in Bodö's history. In addition to the Gripen, the Swedish Air Force will have one Viggen flying and also the Saab 340 Erieye AEW aircraft on static display.

The show takes place on Saturday, June 5, with a VIP dinner for no fewer than 600 guests on Friday evening. The air display itself will also end with a big celebration when the city of Bodö arranges a “hangar party” open to the public. Those that have a general interest in military matters can stay on Sunday, June 6, because this will be a Navy day in Bodö harbor.

Saab-BAe Gripen display pilot Fredrik Mùchler can “rest” until mid-

June (at least as far as air shows are concerned, since he has to work as a test pilot at Saab when he isn't carrying smokewinders round the sky), when the Salon du Bourget outside Paris opens its doors from June 13-20.

Le Bourget has seen many important milestones in Gripen's short history. It was here that the joint venture between Saab and British Aerospace was announced in 1995 and, two years later in 1997, that the export version of Gripen was presented for the first time. This year, however, will be the first time that Gripen takes its place in the air display at Le Bourget.

Another air show at which Gripen has been present several times is Hradec Králové in the Czech Republic, and this year is no exception. The show takes place during the first weekend in September.

Although there may be some late changes in the Gripen display schedule, one thing is certain: there will be no major public Swedish Air Force air show in Sweden this year. Instead, there is a build-up for the year 2000. In June next year, the F7 Wing celebrates its 60th anniversary at Sàtenàs, and later in the year the second Gripen Wing, F 10 at Àngelholm, will host a public air show.



... during the grand finale of last years Gripen air displays, the DEXSA exhibition in South Africa.

Håkan Brandt



Fredrik Mùchler taking off ...

## GRIPEN NEWS

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