



Photo: Anders Nyhlén

## SWEDISH GRIPEN ORDERS EXCEED 200 AIRCRAFT

**The Swedish Air Force is to receive a further 64 Gripen multi-role fighters, bringing the total number of aircraft ordered to 204 including 28 two-seaters. At the same time, a new research program has been launched that will explore the future growth potential of the aircraft.**

The new order, the third placed by the Swedish Air Force, was announced on

June 26 in Stockholm by the Swedish Defence Materiel Administration (FMV) and covers aircraft to equip a further four squadrons. It ensures continuous production of Gripen, the first and only fourth-generation multi-role fighter in service today, for at least another 10 years to satisfy Swedish Air Force requirements alone.

The Gripens in this third batch will in many ways be similar to the export variant developed jointly by engineers at British Aerospace and Saab.

Strengthening its commitment to the Gripen for both domestic and export sales, the Swedish Government has announced a new research program to explore the future growth potential of the aircraft. This aims to further enhance Gripen's already excellent capabilities and flexibility, and will include development and integration of a helmet-mounted display systems, next-generation sensors and future weapon systems. ■



Photo: Torbjörn Caspersson

### Seeing is believing

**General Attila Kositzky, Commander in Chief of the Hungarian Air Force, was so impressed with the radar system in the Gripen flight simulator in Linköping that he did not believe reality could be anywhere near as good. After a 45 minute sortie in a two-seat Gripen he admitted the actual radar quality was as good, if not better, than the simulator.**

Cont. on page 3



Photo: Torbjörn Caspersson

### Chilean evaluation

**A team of 10 Chilean Air Force personnel has visited Saab in Linköping to evaluate Gripen. This is the most extensive evaluation so far. A total of 12 flights were made in the two-seat Gripen, 10 of them by Chilean pilots in the front seat with a Saab "passenger" pilot in the back. The team was lead by General Marcos Meirelles, head of operations in the Chilean Air Force. He was also the first in the team to fly Gripen, after two days of technical briefings and flight simulator sessions.**

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During the 60 years that have passed since it was founded in 1937, Saab has been a pioneer both in developing and using new technologies. Each technological advance has meant new challenges for human factors and human-machine interfaces. Indeed, the ability to take on new technologies at the right time has been a central factor in Saab's ability to maintain its competitive advantage.

An early challenge came in 1943 with the introduction of the Saab 21 fighter, a pusher-propeller type aircraft. One of the difficulties faced by engineers was to develop a safe pilot escape system. This effort culminated in Saab's successful pioneering of the ejection seat.

Next came the Saab 29, also known as "the flying barrel", which was first flown in 1948. This was one of the very first aircraft with a swept wing. With its 25° swept wing, new aerodynamic phenomena were introduced which resulted in new flying characteristics related to handling qualities.

In 1955, the supersonic Saab 35 Draken was the first double-delta wing aircraft, with high lift and turning performance. A number of technologies were developed related to human factors. For example, the two-seater version has a side airbag for safe escape from the rear seat. Furthermore, an ejection seat was developed and tested for ejection at supersonic speed.

The Saab 37 Viggen, first flown in 1967, pioneered several new technologies. To illustrate, there was the innovative aerodynamic configuration with its close-coupled canard delta wing. This feature provided the aircraft with high-lift performance at low speeds, making it suitable for dispersed road-base operations. The new aerodynamic characteristics brought about the development of a flight control system for good flying qualities. This was also the first aircraft equipped with a central digital computer and autopilot.

The Gripen was developed to meet the combined requirements of "information warfare" and close combat defense scenarios. It is the first aircraft to be defined as fourth-generation. As such, the Gripen is a multirole systems

**Saab celebrated 60 years as an aerospace company with an international "Man-Machine and Systems Integration" symposium in Linköping on September 8. This is an excerpt from the concluding presentation by Dr. Billy Fredriksson, Vice President and Technical Director at Saab AB.**



Photo: Johnny Lindahl

## **"The importance of research into human-machine related sciences"**

aircraft incorporating many new technologies, including many important electronic and computer breakthroughs.

The challenges that had to be met during the development of Gripen derived from the multirole requirement, 9G maneuvering performance, small size, light weight, and simplicity and ease of operation with the capacity for autonomous operation from dispersed road bases. The aircraft was designed with the flexibility to adapt to new tactical requirements and to incorporate future technologies. This is possible thanks to computer hardware and software solutions as well as a high degree of integration. Furthermore, the digital flight control system supports the pilot in flying the aircraft. This enables the pilot to concentrate on the main task, that is making optimal decisions and taking the best possible action in fighter, attack or reconnaissance roles.

The Gripen could, in many senses, be described as a "high-density" aircraft: it utilizes a large variety of materials and structures, it has highly packed mechanical and electronic systems, and a high density of information. All these requirements and new technologies have meant new challenges relating to human factors. The physical and mental workload has driven the development of physical protection systems such as the tactical flight combat suit.

At Saab, there is a heavy emphasis on co-operation with the research community. This includes various universities, research institutes and of course the Swedish Defence Materiel Administration. In this interdisciplinary environment, it is important to take a long-term approach in order to acquire new knowledge and effectively implement new technologies.

In Sweden, the importance of research into human-machine related sciences is well-understood, and accordingly, a great deal of investment in this area has been made in recent years (both in the civil and the military communities). Many resources are now available or under construction. I would especially like to mention the dynamic flight simulator, currently under construction in Malmslätt, Linköping. This is a unique facility with a combined simulator and centrifuge that allows us to study operator capacity under both physical and mental loading.

Other examples are Linköping University's National Center for Human Factors in Aviation and its Virtual Reality Center. At Saab, we have invested in a number of different simulators, the most recent being an advanced dome simulator. Indeed, Saab is very fortunate in already having many research activities in human factors concentrated in Linköping. This situation is improved even more now that the Swedish Defense Research Establishment has also decided to concentrate its main activities in human factors research in Linköping. All of this facilitates an excellent environment for co-operation in human factors research. ■



Austrian Saab Draken in formation.

Photo: Sven Scheiderbauer

**Air shows are not a common sight in Austria but when the Hinterstoisser air base and the city of Zeltweg had 60- and 850-year celebrations respectively, they put on a breathtaking show. With Swiss, Italian and Russian display teams, several more from Austria and of course Gripen present, some 150–200,000 people showed up during a weekend in June.**

One of many important visitors was Austrian Defense Minister Werner Fasslabend, who took the time to sit in the Gripen cockpit. He was shown how Gripen's advanced cockpit layout is designed with the pilot in mind and how fourth-generation computers are used to provide just the right information needed in any given situation, no more and no less.

None of the contenders for a future fighter procurement in Austria was invited to do a flying display but the aircraft on the ground gained a lot of attention from the audience. The Gripen aircraft at Zeltweg carried the Swedish Air Force aircraft designation number

35, which can be seen as a tribute to the Austrian Air Force that currently operates Saab 35 Drakens.

Since Saab has supplied aircraft for the Austrian Air Defence for more than 30 years, this was also a big event for the Gripen team. The only remaining Saab 29 Tunnan in flying condition made a nostalgic return to Austria. Once the backbone of Austrian air defense, the sound of the "Flying Barrel" brought back many memories at the air base.

The other three aircraft types that Austria has bought from Saab (so far) all flew in Austrian colors. First a display team with Saab Safirs, something that does not exist even in Sweden, then different formations with the Saab 105 OE and Saab 35 OE now in use in Austria. These are also unique, for instance a group of two 105s and two Drakens and even a formation of 12 Drakens. The maneuvers that the Austrian pilots performed with the Saab aircraft amazed the Saab and Swedish Air Force staff present in Zeltweg.

Apart from the Saab aircraft flown by the Austrian Air Defence, the air show also included displays by a Swedish Air Force Saab Viggen and a Saab Lanser, the latter then being handed over to the Austrian aircraft museum in Graz.

During a press conference at the Zeltweg Air Show, the first Austrian sub-contractor to Saab-BAe Gripen was also announced. As part of the industrial co-operation proposal between Saab-BAe Gripen and Austria, Böhler Scmiedetechnik in Kapfenberg has signed a contract to produce parts for the Gripen landing-gear. ■



**Gripen pilot Berndt Weimer instructs Defense Minister Werner Fasslabend in the Gripen cockpit.**

Photo: Sven Scheiderbauer

Cont. from page 1, "Seeing is believing"

"The radar image is unbelievably clear and we used it to track targets in the air, on the ground and at sea," he said. One of the images on the radar screen turned out to be the Commander of the Swedish Air Force, Lieutenant General Kent Harrskog, flying a fighter Viggen. The two aircraft flew in formation enabling General Kositzky to experience the difference in maneuverability between a third- and a fourth-generation fighter.

General Kositzky is the first Air Force C-in-C outside Sweden to fly Gripen, though he is not the first Hungarian. Two of his Hungarian Air Force pilots flew Gripen during a pre-evaluation period in June this year. ■

Cont. from page 1, "Chilean evaluation"

While the pilots experienced the benefits of a fourth-generation aircraft in the air, other members of the team were doing other evaluations. Two Chileans were assigned to financing and cost, reviewing life-cycle costs and Government support. Together with the engineers in the team they had a chance to see how the Swedish customer, the Air Force and the Defence Materiel Administration, has organized its Gripen support functions. One of the more impressive displays was a demonstration of how fast the Volvo RM12 engine can be removed and replaced. One hour in field conditions is the required time, using standardized equipment that is also used for operational turn-arounds. ■

# READY FOR OPERATIONS!

**“After this exercise I’m ready to declare the first Gripen squadron operational.” These were the words of the Commander of the Swedish Air Force, Lt. Gen. Kent Harrskog, at the culmination of the first Gripen combat exercise.**

The exercise, in which some 20 Gripens from the F7 Air Force Wing participated with the 72nd Base Battalion, had as its primary goal to provide conversion training under field conditions for conscripts in the turn-around units. Since the aircraft itself has been successfully tested under field conditions, now was the time for the support as well as the command-and-control functions.

After the exercise Lt. Col. Jan Wahlgren, Commander of the Base Battalion, was in his own words literally walking on clouds.

“This exercise was outstanding, even better than we had hoped for. We had all the aircraft needed to train a battalion of this size and made more than 150 sorties during the final stage of the exercise. We have heard people say that



Photo: Johnny Lindahl

with such a high-tech system as Gripen we could never use it in the woods where we have our road bases. Boy, did we prove them wrong!”

To thank all the people involved, and all the neighbors that had heard the exercise day and night, 10 aircraft were used during the last day for something never seen before. They gathered in one formation and did a fly-by around the area that had been covered by the exercise.

About 1000 people were called upon to take part in the exercise, 650 of them being conscripts who received

their basic training on the AJ 37 Viggen system between one and five years ago. This was the first time that they had had a chance to train on Gripen, and there were three weeks in which to do so. Among the 350 officers were 50 from the Reserve. Even 30 “conscript” dogs were called in to serve alongside the eight dogs that belonged to the Air Base Rangers.

According to Colonel Jan Jonsson from the Air Warfare Center, a number of components of the Air Force 2000 concept were tested. “The Air Component Command is using a development version of the new Command and Control Information system. The fighter controllers are using a test version of the new StriC 90 system and the initial functions of the new tactical radio system (TARAS). Ground communication systems are also being tested under field conditions.”

During the first two weeks of the exercise the ground forces were undergoing conversion training but during the second week the Gripen fighters flew into action. They participated in an air defense exercise together with Viggens from the F16 Air Force Wing.

The 72nd Base Battalion exercise ended with a 72-hour period of around-the-clock operations, simulating actual combat operations.

The whole exercise took place on and from a dispersed base in the western part of Sweden. Lieutenant Bengt Sahleryd explained the system with dispersed bases.

“The Swedish Air Force has a system called protection by dispersion. In the event of war, all the peacetime air bases are totally disbanded and the activity is moved to dispersed bases, in this case a 20km x 30km area with a



Photo: Ulf Fabiansson

main runway for all-weather day and night flying. Connected to that is a series of road bases, ordinary roads that also can serve as runways and taxiways. Along these roads are ‘pockets’ of space in the woods where turn-arounds can be performed.”

The 72nd Base Battalion has eight fully mobile turn-around groups. Each group has one truck with the crew and a trailer with all the equipment and tools necessary, one fuel truck and one ammunition truck. Each member of the crew has specific duties, but all can if necessary perform each others’ tasks.



Photo: Johnny Lindahl



Gripen News talked to two conscripts after they had just spent five hours working with night fighter missions. Both of them had finished their basic training on the Viggen in June 1996 and had now been called back into service for three weeks to learn how to work with Gripen.

"A turn-around for a fighter mission means that everything has to happen real fast," says Hampe Bergholtz, a 22-year-old who normally spends his days working in a warehouse in Falkenberg,

"We have to be able to go from our

camp to the place where the aircraft will land in about five minutes. We are supposed to be by the runway when the aircraft lands, do the turn-around in less than 10 minutes and then move out again as soon as the Gripen takes off."

During the night they were called out to three different locations, but Bergholtz does not see that as any kind of limit: "We can do more than that during one night".

As the No. 5 mechanic in the team of five conscripts and one technician, Bergholtz's task is to direct the aircraft to the place where it is going to stop and then connect a cable to the aircraft for communication between the pilot and the "outside" world. That could mean a technician beside the aircraft or a command-and-control center some distance away. Having established communications, No. 5 is responsible

for hanging the weapons on the left side of the aircraft.

"This is a cool aircraft and we were very excited to get to work with it," says Hampe. "It is even easier than working with Viggen. We do the same thing but with Gripen you need less equipment."

Stefan Nyberg explains further: "We actually have fewer things to do, it's easier and it takes less time. One example is that the aircraft itself keeps track of what kinds of weapons you put on the pylons, and which pylons you put them on."

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Photo: Johnny Lindahl

# POLISH AIRSHOW



Photo: Lars Jansson

Getting your photo taken by the Gripen mock-up was one of the popular events at Mielec.

**Two Gripen aircraft visited the WSK PZL Mielec aircraft factory in late August when the 60-year-old Polish aircraft company celebrated the 50th anniversary of the successful Antonov An-2 which it has long built under licence. Also invited were representatives of those who actually build Gripen, the trade unions at BAe and Saab.**

The union representatives were invited by the Polish Solidarity Union. John Deans, from the Manualworkers Union at BAe, said that he knew what the Polish aerospace industry was going

through right now because the same winds of change had forced the British and Swedish industries to restructure. He was sure that the aerospace industries in Europe could help each other to



Photo: Lars Jansson

**Senior Industrial Collaboration Manager David Broadbent and interpreter Second Lieutenant Ella Karlsson signing autographs at the Gripen stand.**

make the transition as smooth as possible. Both trade unions at PZL Mielec have already visited the Gripen production line in Linköping, Sweden.

Poland's long tradition of aircraft manufacturing could be seen everywhere at the air show, both through the different Polish aircraft exhibited and the knowledge and appreciation of the large audience present. As a gift to the aircraft museum in Krakow, the Swedish Air Force Museum in Linköping presented a Saab Draken that had also performed at the air show. Saab and British Aerospace also displayed their own proud heritage but, more importantly for Poland, pointed to the future by means of a Gripen air display. ■

## GRIPEN HELPS CELEBRATE AVIATION DAY

**The Gripen team in Warsaw helped Poland celebrate National Aviation Day in style by arranging a celebration flypast by two historic aircraft spanning more than 40 years of aviation history.**

With help from the Old Flying Machine Company in Duxford, Cambridgeshire, and the Swedish Air Force, a formation flypast of a world-famous Spitfire fighter aircraft in Polish markings and fourth-generation Gripen delighted thousands of aviation enthusiasts at the Bydgoszcz Air Day on Friday 29 August.

It was the first and only time that the two aircraft types had flown together, signifying links between the historic Spitfire (built by companies now part of British Aerospace) and state-of-the-art Gripen fighter, the world's first fourth generation combat aircraft to enter service.

For Spitfire pilot Mark Hanna, whose visit to Poland was sponsored by Saab-BAe Gripen, the journey from Duxford was far from easy. "Severe thunderstorms dominated much of northern Europe and at one point I was forced to land in the Netherlands until the weather cleared sufficiently to continue my journey," he said.

"The reception Spitfire received on arrival made it all worth while and it was thrilling to fly in formation with such an exciting aircraft as Gripen."

Widely experienced in all aspects of display flying, former Royal Air Force pilot Mark Hanna can be seen flying a Czech-built L-39 aircraft in the new James Bond movie. It was the second time Mark's Spitfire had supported the work of Saab-BAe Gripen this year, having previously appeared at the Goraszka Air Show near Warsaw during June. ■

## Czech cleared for take-off

A security agreement has been signed between the Czech Republic and Sweden allowing exchange of classified information and pilots from the Czech Air force to fly Gripen. The agreement was signed during the airshow in Hradci Králové, Czech Republic, by Lieutenant General Radovan Procházka, Director for the Section for Defence Policies – Czech Armed Forces and Major General Staffan Näsström, Chief of FMV Air Force Materiel Command.

Hans Krüger, Senior Vice President of Saab, said "This important milestone means that a team from the Czech Air Force will visit Sweden in the near future to fly Gripen as part of their aircraft evaluation. ■

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

**Brazilians fly Gripen**

The chief of the Brazilian Air Force, Ten Brig do Ar Ronald Eduardo Jaeckel, and Brig do Ar Juniti Saito both flew Gripen during a recent visit to Sweden. The two were invited by the Swedish Air Force and saw Gripen in action during the F7 combat exercise.

Two Gripen two-seaters were used when the generals took off with a Swedish co-pilot each. Magnus Ljungdahl who flew with Brig Jaeckel took the aircraft to a test area

and then handed over the controls. The Brazilian Air Force chief then flew the aircraft himself and also made the instrument approach to Saab Airfield, Linköping.

Asked about preparing for the flight, Brig Jaeckel said that there was not really any need for preparations. He is an experienced pilot and found Gripen very easy to fly. All it took was about an hour in the simulator to familiarize himself with the various systems and controls. ■



**Hans Krüger Senior** VP Saab AB with the airforce chiefs **Kent Harskog** and **Ronald Eduardo Jaeckel**

Photo: Johnny Lindahl

**British team aids Polish disaster recovery**

A team of environmental engineers from British Aerospace, in partnership with the British Embassy in Warsaw, has visited the Opole region of Poland to assess the extent of recent flood damage to industrial areas and help local authorities prepare a strategy for recovery.

"With much of the Opole region actually below sea level, our team found that many dikes had been breached by water from the swollen rivers. This had a catastrophic effect on

local businesses and employment", comments Simon Carr, Director British Aerospace Poland and leader of the Gripen for Poland campaign team. "In some cases sludge, more than a half metre deep, has flooded factory floors" he added.

Using environmental management of site reclamation contracts, the recovery team was led by Jeremy Burnstingle from British Aerospace Royal Ordnance and Richard Ciaglinski, Army and Navy Attaché, British Embassy in Warsaw.

Leading Gripen marketing atti-

vities in-country, British Aerospace Poland aims to develop long term partnership in areas of business not simply restricted to defense and aerospace. This will help integrate Poland into the heart of Europe, ensuring economic and employment benefits well into the next millennium.

In August, Swedish Prime Minister Göran Persson visited the flooded area and promised aid for a total value of 125 million Swedish kronor (19 million USD). ■



**Race car legend, Jackie Stewart,** under the Gripen banner.

Photo: Lars Wigert

**Gripen trophy ends productive week**

The Gripen team in the Czech Republic concluded its busiest-ever week of industrial and commercial activity mid September with the first ever Gripen Trophy Historic Formula 1 motor race, the climax of the Masaryk Grand Prix weekend at Brno Autodrome.

Steve Mead, Gripen Campaign Director, said: "Our week began with extremely constructive discussions between Saab-BAe Gripen and senior Czech government officials

from the Ministries of Finance and Trade and Industry."

The government briefings preceded the largest ever supplier symposium held in Central Europe, organized by the Gripen team and held in the Prague Hilton. Directors from British Aerospace, Saab, Volvo, ABB, Ericsson and other companies in the Investor Sphere outlined business opportunities available through industrial partnership and co-operation to senior representatives from around 100 Czech companies. ■

**Hradec Králové**

Speaking at the Hradec Králové, Czech Republic, air show in early September, Alan Garwood, Managing Director Europe and North America, told an audience of more than 60 journalists that by selecting the state-of-the-art Gripen fighter,

the Czech Republic would not only be choosing the best option for its modern defense needs, but also for the nation's economy.

"Selecting Gripen will give access to a truly European/transatlantic alliance, presenting real opportunities for economic growth and

potential well into the next century", Mr Garwood said. "A combination of experience and expertise from Gripen suppliers on both sides of the Atlantic, whose annual global business exceeds US\$500 billion, ensures the best industrial packages will be available to Gripen customers." ■

Saab celebrated 60 years as an aerospace company in September by organizing the largest air show in Sweden this year and also by adding the word **Aero-space** to the Saab symbol, replacing Scania which is now a separate company.

# HOME FIELD ADVANTAGE



Photo: Johnny Lindahl



Photo: Lars Hejdenberg



Bengt Halse, President and CEO of Saab, said that the new symbol was the start of a new era. There are but a handful of aerospace companies left in the world that have the capability to design and manufacture both a new-generation fighter and a new-generation commuter aircraft. Saab is one of them.

The Gripen display pilot, Major Ken Linberg, has been so busy touring

Europe during the past 12 months that this was actually the first time that he had performed on his home stage in the skies over Linköping, Sweden. There is probably not a single soul in Linköping that has not seen Gripen in the distance, but to see the air display at close range was something else.

Even though the rain was pouring down a few kilometers away, more than 60,000 spectators gathered to watch the display in the bright, windy but dry con-

ditions at the Saab/Linköping airfield. This was not including the approximately 20,000 Saab employees and families who had seen the air show the day before during a special family day.

What they saw was not only the solo display by Gripen but also a formation of four Gripens in what could be described as an air ballet. What has never been seen before was a historical fly-by of Saab military aircraft from the 1950s onwards, consisting of the J29 Flying Barrel, A32 Lansen, SK60/Saab 105, J35 Draken, JA37 Viggen and of course Gripen. ■



Photo: Johnny Lindahl

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Stefan, also 22 but a sheet-metal worker from Kungsbacka outside of Gothenburg, found it very easy to switch from Viggen to Gripen. The last time he did a turn-around, or even met his teammates, was more than a year

ago. Still, after just five days back in uniform they were doing "live" turn-arounds on an aircraft they had never worked on before. Granted, there was a skilled technician in the group, but then there always is in the system that the Swedish Air Force uses. ■

## GRIPEN NEWS

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