

Alpine Tigers **fo**



Anonymous two-seat F-5F J-3210 carrying an AIM-9P5 Sidewinder training round on the starboard wing-tip weapons rail, seen high over Switzerland.

SWITZERLAND BOUGHT 72 F-5 Tigers in 1976 and another 38 in 1981 – totalling 98 F-5E single-seaters and 12 F-5F dual-seat trainers. More than thirty years and 250,000 flight hours later, 44 have been sold to the United States Navy and nine written off in accidents. Some 54 remain in service, but not for long, because, as the Swiss Air Force says: “An old tiger does not jump anymore, it stays on the ground.”

In January 2008, the country started searching for a replacement aircraft under the Tiger-Teilersatz (TTE, partial Tiger replacement) programme. Three frontline squadrons are to be equipped with the new fighter, but the Patrouille Suisse aerobatic team faces an uncertain future.

Militia Pilots

Switzerland is the last country in Europe to have active duty squadrons equipped with the F-5. Only Spain still operates the type (F-5B Freedom Fighters – the earlier, slightly smaller and less

Force extinction

For many years Switzerland's citizen pilots have flown fast military jets. But that will end when the F-5 is finally retired from Swiss Air Force service. **Dirk Jan de Ridder** reports.



powerful F-5 variant), and only then for training purposes. The Swiss Air Force received its first F-5s at the end of the 1970s to replace the de Havilland Venom and to fill a gap caused by increased use of the Hawker Hunter for ground attack. The F-5 served very well. With its high reliability, ease of maintenance and low operating costs, it is especially suited for the country's militia system. Militia pilots are part-time pilots flying at least once every four weeks and for a minimum 50 hours a year (against 150 hours for a Hornet pilot) – spread over an intensive three-week Wiederholungskurs (WK, repetition course), a five-day Trainingskurs (TK, training course) and several training flights independent of squadron activity. Most individual training flights are 'red air' missions, playing the 'bad guys' against Hornet pilots.

As well as being Air Force pilots, they have regular jobs, often as commercial aircrew but also outside aviation. Currently about 90% of all F-5 pilots are militia pilots – and, as all fighter pilots now joining the Air Force go full-time on the

Hornet, the F-5 will be the last jet to be flown by part-time aircrew.

At the end of 2010, the Swiss Air Force's Tiger fleet comprised 42 F-5Es and 12 F-5Fs. They are flown by three frontline squadrons (Fliegerstaffeln 6, 8 and 19 at Payerne, Meiringen and Sion respectively) and by the Patrouille Suisse display team which is based at Emmen. Apart from weeks when TK and WK exercises are held, flying activity at Sion and Meiringen is often very low. This is partly due to noise avoidance but also because of the nature of the militia system. Except for the Patrouille Suisse's aircraft, the F-5s are not allocated to a specific squadron. Whenever needed, they deploy to Emmen, Meiringen or Sion, but most flights take place from Payerne regardless of a pilot's squadron or home base. In fact, Payerne is where over 50% of all jet activity takes place.

"An old tiger does not jump anymore, it stays on the ground."

While the operational F-5 squadrons seldom deploy abroad anymore, the Tigers of the Patrouille Suisse are regularly seen at air-shows throughout Europe. The team has been flying the F-5E from 1995. All members are primarily active-duty Hornet pilots, flying the F-5 part-time with the Patrouille

Suisse. But with the retirement of the Tiger in a few years' time, the future of the team looks uncertain as the new fighter will be too expensive for formation demonstration flights. In December 2009, Chief of the

Armée Forces André Blattmann said the Tiger may continue to fly "until the end of the decade" and Patrouille Suisse will fly the F-5 for the same period. Rumours suggest the team may merge with the Pilatus PC-7 equipped 'PC-7 Team' after that.

Operations

The F-5's main roles are air defence and air policing. Unlike its surrounding NATO ▶

Alpine Tigers Face Extinction

countries, Switzerland does not maintain permanent quick reaction alert (QRA) interception cover. Airspace is monitored by radar 24 hours a day, 365 days a year, but air defence is only provided during office hours on weekdays. It is only on special occasions (such as the annual World Economic Forum in Davos) and in times of crisis that round-the-clock QRA is conducted.

During the World Economic Forum (WEF), which convenes annually in the Swiss resort of Davos, at least one pair of Hornets is always airborne at any given moment, fully armed and ready to intercept incoming aircraft, with Tigers assigned to air policing. A Wiederholungskurs is normally organised to run at the same time as the WEF to make sure enough F-5 pilots are available. When, in 2010, a cloud of volcanic ash from Iceland halted flying operations over large parts of Europe, including Switzerland, QRA aircraft were put on alert to intercept any aircraft ignoring flight prohibitions; but such a readiness state is only provided by the Hornet squadrons. Switzerland's maximum extension (from east to west) is less than 220 miles (350km) and traversed by airliners in less than 20 minutes, leaving little time for fighters to get airborne and intercept their target. But agreements with neighbouring countries, including the French, Germans, Austrians and Italians who monitor the approaches to Swiss airspace and provide their own QRA, obviate the need for constant QRA by the Swiss. For the Euro 2008 football tournament for example, Germany provided two F-4Fs standing QRA from Neuburg, the Swiss two F/A-18s and the French two Rafales, which provided Combat Air Patrols during a match and Swiss helicopters



Above: F-5E J-3015 taxis out during a Wiederholungskurs at Sion carrying an orange centre-line fuel tank, used to distinguish 'blue-air' jets from those operated by 'red-air'. F-5s usually play the bad guys (red-air) against their colleagues flying Hornets.

and PC-7s patrolled the skies near the event.

While the F-5 is limited to defensive roles, its replacement will also have to fulfil ground attack and reconnaissance roles, neither of which are currently conducted by the Swiss Air Force. When the Mirage III RS retired in 2004, a gap was created in the Swiss Air Force's reconnaissance capability that will be filled by the Tiger's replacement. The

ground attack role was given up as long ago as in 1994 when the Hunter was withdrawn from use. Apart from being needed to cover these roles, the F-5's replacement is required urgently as the Tigers are increasingly affected by cracks and corrosion.

The F-5 is now also very outdated. Captain Martin Hess, a pilot currently flying the F/A-18 but with experience on the F-5, explains: "The days of winning a fight in the F-5 against an F/A-18 are over. The F-5's radar looks forward for a couple of miles and that's it. It has a display with a cross in the front and the pilot has to bring the other aircraft into that cross to be able to fire a missile. With the F/A-18 we are much better-equipped. The joint helmet-mounted cueing system enables us to shoot around the corner. If we can see an aircraft, we can shoot it down from that angle. The F-5's only advantage is its small size; its pilots play a lot with their visibility and with radar tactics. But 99% of all fights are won

F-5 SQUADRONS

Fliegerstaffel 6	F-5E / F	Payerne
Fliegerstaffel 8	F-5E / F	Meiringen
Fliegerstaffel 19	F-5E / F	Sion
Patrouille Suisse	F-5E	Emmen

Home bases listed are 'wartime' bases, which are intensively used during TK and WK exercises. Regular training flights often take place from Payerne. 'Fliegerstaffel' is the most commonly-used designation for a squadron, as 72% of the Swiss population speaks German, but 'Escadrille d'aviation' (French) and "Squadriglia d'aviazione" (Italian) are also used.



F-5F J-3210 breaks away from the camera-ship and clearly shows the Vista-5 ECM pod under the port wing. The aircraft is flown by a pilot in the front seat whilst the back-seater operates the electronic combat equipment.



Above: Meiringen and Sion air bases are both in valleys amongst the Swiss mountains and as a result pilots have to deal with steep approaches and climb-outs as well as other aspects of mountain flying that include temperamental weather. This makes it difficult for militia pilots but is workable during exercises. Training flights are more often made from Payerne.

by the Hornet."

Concerning daily flight operations, he adds: "Normally we play F/A-18 v F-5. This helps us to distinguish blue air from red air. The F-5 has a single tail fin whereas the Hornet has a double one, but during a fight it is quite difficult to see that. We therefore often equip F-5s with orange fuel tanks and missiles to identify them as part of red air, so we don't have blue air shooting other blue air jets. Generally, we only fly F/A-18 v F/A-18 in beyond visual range [BVR] combats."

Moreover, the F-5 is only flown during daytime. It is not an easy aircraft to fly at night, over mountains or through difficult weather, mainly because of issues with situational awareness (especially compared to the Hornet with its excellent radar, night vision goggles and joint helmet mounted cueing system). This leaves a fleet of only 33 Hornets to conduct air policing missions at night during events like WEF. Without replacing the F-5, the Hornets would only be able to fulfil round-the-clock air policing, with four fighters airborne at any given moment, for two consecutive weeks. Early in the replacement

aircraft evaluation process, when there was still a requirement for 33 new jets, research showed that the new fighters together with the Hornet fleet would enable the Swiss Air Force to continue constant air policing for up to seven consecutive weeks. Later the requirement was reduced to 22 new jets, mainly for financial reasons.

The F-5 Tiger also performs a number of secondary roles, including electronic combat training and target towing – again in support of F/A-18 training flights. The F-5 is even used to collect data about radioactivity at high altitudes for the Federal Office of Public Health. Carrying two pods with high-altitude air-filters, six flights are normally scheduled each year. In April 2010, four additional flights were made to research the volcanic ash cloud that paralysed European air traffic. In comparison to the Hornet, the Tiger is a very cost-efficient asset which makes it ideal for such secondary missions. Another advantage is that F-5s are typically flown by militia pilots, so full-time pilots can focus their attention on combat roles.

Flight Training

When the Swiss Air Force retired the Hawk Mk 66 trainer in 2003, the F-5F replaced it in the jet pilot training role. For several years fighter pilots were trained on the PC-7 and F-5 before converting to the Hornet. In 2008, six Pilatus PC-21s were delivered for lead-in fighter training (LIFT). In the summer of 2008, the first pilot class was introduced to the PC-21, while the last pilot class completed its training on the F-5 the same year. Two additional PC-21s were recently purchased with Switzerland's Armament Programme 2010 budget to meet the requirement of training six to eight jet pilots each year. Compared to the F-5, the PC-21 is less noisy and less expensive to operate. A PC-21 flight can take up to two hours, while a pilot in the F-5F has to deal with fuel shortage within an hour. After 30 weeks of basic flying training on the PC-7, students still need 45 weeks of advanced flying training on the PC-21 to graduate.

Both the PC-7 and PC-21 are now equipped with digital cockpits. It makes no sense anymore for student pilots to transition to the F-5 with its analogue cockpit: so after graduating on the PC-21 they now step straight into the cockpit of the F/A-18 Hornet. The F-5Fs that remain in service now perform a variety of roles including electronic countermeasures (ECM) training. Equipped with an Ericsson Erijammer A-100 'Vista-5' jamming pod under the left wing (and a counter-weight under the right wing), operators in the back-seat of the F-5F jam enemy radar systems while the pilot in the front flies the aircraft.

Replacement Evaluations

In 2006, four candidates to replace the F-5 were selected for evaluation: the Boeing F/A-18E/F Super Hornet, Dassault Rafale, EADS EF2000 Eurofighter and Saab JAS-39 Gripen. In April 2008, Boeing surprisingly withdrew its Super Hornet from the competition due to a "gap between the requirements for an F-5 replacement and the ▶



The Swiss aerobatic display team, 'The Patrouille Suisse,' regularly attends airshows throughout Europe with six or seven brightly coloured F-5s. When not being flown by the team the jets are used for target towing.

F-5 sale to US Navy

BETWEEN 2003 and 2008, 44 Swiss Air Force F-5E Tigers, with an average of just 1,800 flying hours and an excellent maintenance history, were sold to the US Department of the Navy. Each F-5 was dismantled at Emmen and airlifted to Northrop Grumman's plant at St Augustine, Florida, by C-130 Hercules. After five months of refurbishment the jets were re-designated F-5N and they now fulfil the 'adversary' role with the United States Marine Corps and United States Navy. The F-5N will continue to fulfil this role until at least 2015.

next-generation capabilities of the F/A-18E/F Super Hornet Block II". The remaining three candidates submitted their proposals and their aircraft were test-flown from Emmen air base in August (Gripen), October (Rafale) and November (Eurofighter) of the same year, each manufacturer sending two twin-seat aircraft.

Before these flight evaluations could take place, six pilots – two test pilots from Armasuisse (Switzerland's arms procurement organisation), two general staff pilots and two active-duty Hornet pilots – were sent to France, Germany and

Two F-5Es taxi back to the ramp at a snowy Sion.



Sweden for a week of instruction on the aircraft they would fly. The courses typically included long days of classroom briefings, flight simulator rides and a day to visit a squadron actually operating the aircraft. Back in Switzerland all six pilots flew sorties in all three competing jets, assisted by the manufacturers' pilots in the back-seats. The test programme included a familiarisation flight for each pilot; one-on-one dogfights; aerial combats with two 'TTE candidates' and two Hornets against other Swiss jets. Ground attack and reconnaissance sorties, supersonic flights, night operations; and

noise measurements at Emmen and Meiringen were also undertaken. The Gripens accumulated 30 flights (35 flying hours), the Eurofighters 31 flights (45 hours) and the Rafales totalled as many as 39 flights (60 hours), due to tests with different radar systems. After the evaluation was completed the companies were asked to send two final proposals – one with the budget limited to 2.2 billion Swiss Francs (1.5 billion Euros) and another for 22 aircraft. Each company also proposed differing degrees of industrial offset deals to defray the costs.

The results of the evaluation were presented to the government, to make a final decision, but because of the uncertain financial situation, in April 2010 it was decided to postpone the decision until the autumn, when a new security analysis for the armed forces was due to be presented. However, on August 25, 2010, it was announced that the decision had been put off again; this time until 'no later than' 2015! The decision about replacing the F-5 will be based on the outcome of this analysis but now will not be made until after the next General election in October 2011. To make things worse, Armasuisse, admitted that it got its figures badly wrong when allocating funding for the new fighter and now says that the figure required for 22 machines is



F-5E J-3095 was amongst the last to be delivered to the Swiss Air Force. The badge on the nose is a combination of those of FlplAbt 3 and FlKp 8 and was painted on aircraft participating in the last ever refresher course at the now closed Turtmann Air Base.



more likely to be in the region of 4 - 5 billion SFr – and that does not include the cost of operational support over the lifetime of the programme.

Near Future

Initial operational capability (IOC) of the first squadron of the new aircraft was originally planned for late 2014, which, as a consequence of the government's decision to delay the replacement, will not be achieved. Any new platform selected to fill the requirement is unlikely to enter service before the second half of the decade at the earliest. Recently, Swiss Air Force commander Lieutenant General Markus Gygax pointed out that retiring the F-5 without a replacement is not an option, saying new fighter jets must be flying over Switzerland by 2020.

Whatever aircraft is finally selected, the fact is that the Tiger will continue to serve the Swiss Air Force for several years to come. By the end of this decade, Switzerland will retire its last 'classic' jet, but its replacement will doubtless be an important leap forward in terms of capability and performance. There is no room for sentiment when it comes to defence.



Above: The F-5E is equipped with a double 20mm M39 cannon capable of firing 1,500 rounds per minute. The gun is primarily intended for air combat but ground attack is practised at the Ebenfluh/Axalp shooting range. The F-5F only carries one cannon.

Below: Sion is the war-time base of Fliegerstaffel 19. This F-5E, J-3072, carries the badge of Fliegerstaffel 13, a former F-5 operator that disbanded as long ago as December 2003. No F-5s are assigned to a specific squadron nowadays so any markings seen on the jets are purely for decorative purposes.



F-5 ROLLCALL

Below is a list with all 54 F-5s still operated by the Swiss Air Force. F-5s J-3081 to J-3091 are flown by Patrouille Suisse, and all others are operated by the three operational squadrons.

Active Duty			Disposals		
J-3005	F-5E	active duty squadrons	J-3001	F-5E	to US Navy as 761526
J-3015	F-5E	active duty squadrons	J-3002	F-5E	to US Navy as 761527
J-3030	F-5E	active duty squadrons	J-3003	F-5E	to US Navy as 761528
J-3033	F-5E	active duty squadrons	J-3004	F-5E	in storage (Emmen)
J-3036	F-5E	active duty squadrons	J-3006	F-5E	to US Navy as 761531
J-3038	F-5E	active duty squadrons	J-3007	F-5E	to US Navy as 761532
J-3041	F-5E	active duty squadrons	J-3008	F-5E	to US Navy as 761533
J-3044	F-5E	active duty squadrons	J-3009	F-5E	to US Navy as 761534
J-3052	F-5E	active duty squadrons	J-3010	F-5E	to US Navy as 761535
J-3057	F-5E	active duty squadrons	J-3011	F-5E	to US Navy as 761536
J-3062	F-5E	active duty squadrons	J-3012	F-5E	to US Navy as 761537
J-3063	F-5E	active duty squadrons	J-3013	F-5E	written off (May 21, 1981)
J-3065	F-5E	active duty squadrons	J-3014	F-5E	in storage (Emmen)
J-3067	F-5E	active duty squadrons	J-3016	F-5E	to US Navy as 761541
J-3068	F-5E	active duty squadrons	J-3017	F-5E	written off (January 22, 1987)
J-3069	F-5E	active duty squadrons	J-3018	F-5E	written off (November 18, 1981)
J-3070	F-5E	active duty squadrons	J-3019	F-5E	to US Navy as 761544
J-3072	F-5E	active duty squadrons	J-3020	F-5E	to US Navy as 761545
J-3073	F-5E	active duty squadrons	J-3021	F-5E	to US Navy as 761546
J-3074	F-5E	active duty squadrons	J-3022	F-5E	to US Navy as 761547
J-3076	F-5E	active duty squadrons	J-3023	F-5E	to US Navy as 761548
J-3077	F-5E	active duty squadrons	J-3024	F-5E	to US Navy as 761549
J-3079	F-5E	active duty squadrons	J-3025	F-5E	to US Navy as 761550
J-3080	F-5E	Patrouille Suisse	J-3026	F-5E	to US Navy as 761551
J-3081	F-5E	Patrouille Suisse	J-3027	F-5E	to US Navy as 761552
J-3082	F-5E	Patrouille Suisse	J-3028	F-5E	written off (July 4, 1996)
J-3083	F-5E	Patrouille Suisse	J-3029	F-5E	to US Navy as 761554
J-3084	F-5E	Patrouille Suisse	J-3031	F-5E	to US Navy as 761556
J-3085	F-5E	Patrouille Suisse	J-3032	F-5E	to US Navy as 761557
J-3086	F-5E	Patrouille Suisse	J-3034	F-5E	to US Navy as 761559
J-3087	F-5E	Patrouille Suisse	J-3035	F-5E	to US Navy as 761560
J-3088	F-5E	Patrouille Suisse	J-3037	F-5E	to US Navy as 761562
J-3089	F-5E	Patrouille Suisse	J-3039	F-5E	to US Navy as 761564
J-3090	F-5E	Patrouille Suisse	J-3040	F-5E	to US Navy as 761565
J-3091	F-5E	Patrouille Suisse	J-3042	F-5E	written off (10 Apr 1987)
J-3092	F-5E	active duty squadrons	J-3043	F-5E	to US Navy as 761568
J-3093	F-5E	active duty squadrons	J-3045	F-5E	to US Navy as 761570
J-3094	F-5E	active duty squadrons	J-3046	F-5E	to US Navy as 761571
J-3095	F-5E	active duty squadrons	J-3047	F-5E	to US Navy as 761572
J-3097	F-5E	active duty squadrons	J-3048	F-5E	written off (August 15, 1984)
J-3098	F-5E	active duty squadrons	J-3049	F-5E	to US Navy as 761574
J-3201	F-5F	active duty squadrons	J-3050	F-5E	to US Navy as 761575
J-3202	F-5F	active duty squadrons	J-3051	F-5E	to US Navy as 761576
J-3203	F-5F	active duty squadrons	J-3053	F-5E	to US Navy as 761578
J-3204	F-5F	active duty squadrons	J-3054	F-5E	to US Navy as 761579
J-3205	F-5F	active duty squadrons	J-3055	F-5E	to US Navy, as 761580
J-3206	F-5F	active duty squadrons	J-3056	F-5E	preserved Verkehrsmuseum (Luzern)
J-3207	F-5F	active duty squadrons	J-3058	F-5E	to US Navy as 761583
J-3208	F-5F	active duty squadrons	J-3059	F-5E	written off (November 9, 1982)
J-3209	F-5F	active duty squadrons	J-3060	F-5E	to US Navy as 761585
J-3210	F-5F	active duty squadrons	J-3061	F-5E	to US Navy as 761586, rebuilt to F-5F
J-3211	F-5F	active duty squadrons	J-3064	F-5E	to US Navy as 761589
J-3212	F-5F	active duty squadrons	J-3066	F-5E	to US Navy as 761591
			J-3071	F-5E	written off (January 22, 1987)
			J-3075	F-5E	to US Navy as 810834, rebuilt to F-5F
			J-3078	F-5E	written off (October 31, 1994)
			J-3096	F-5E	damaged, instructional airframe (Meiringen)