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THE FINNISH AIR FORCE FACES THE 1990s

Richard A. Bitzinger

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PREFACE AND ACKNOWLEDGMENTS

In May 1989, the author traveled to Finland and met with several officials and analysts in the Finnish armed forces and defense and foreign ministries. He also visited Finnish military installations, including the Lapland Air Defense Wing in Rovaniemi. This paper is based on that trip and other research.

Many people helped to make this trip a success; unfortunately, they are too numerous to mention. The author would, however, like to thank in particular Pekka Karhuvaara of the Finnish Consulate General in Los Angeles, Colonel Pekka Kanninen of the Lapland Air Defense Wing, Lieutenant Colonel Kari Kokkonen of the Finnish Ministry of Defense, and Major Hannu Aikio of the Finnish Army. The author would also like to thank Finnfacts for helping to arrange his itinerary. Finally, thanks are due to RAND colleague John Lund for his helpful criticisms and suggestions.



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THE FINNISH AIR FORCE FACES THE 1990s

Finland, although not exactly standing at the crossroads of Europe, occupies a sensitive and potentially strategic position between NATO and the Warsaw Pact. Any armed clash between the superpowers in northern Europe would almost certainly involve this small country. Furthermore, as a nation that fiercely prizes its neutrality, Finland has no one to turn to for its national defense other than itself. Its own armed forces, therefore, must be sufficient for this task.

These rather general statements are even more appropriate when looking specifically at Finnish airspace and the current state of the Finnish Air Force (FAF). The airspace over Finland may be more of an important transit area than the ground beneath it. Certainly Soviet aircraft on their way to attack targets in Norway or the North Atlantic would find the temptation to use the "Finnish shortcut" difficult to avoid. In addition, the likelihood of either U.S. or Soviet cruise missiles violating their national airspace has vexed the Finns for a decade.

It is little wonder, therefore, that over the past fifteen years the Finns have placed an increasing emphasis on their airpower. And as Finland enters the 1990s, the importance of its air force should only intensify.

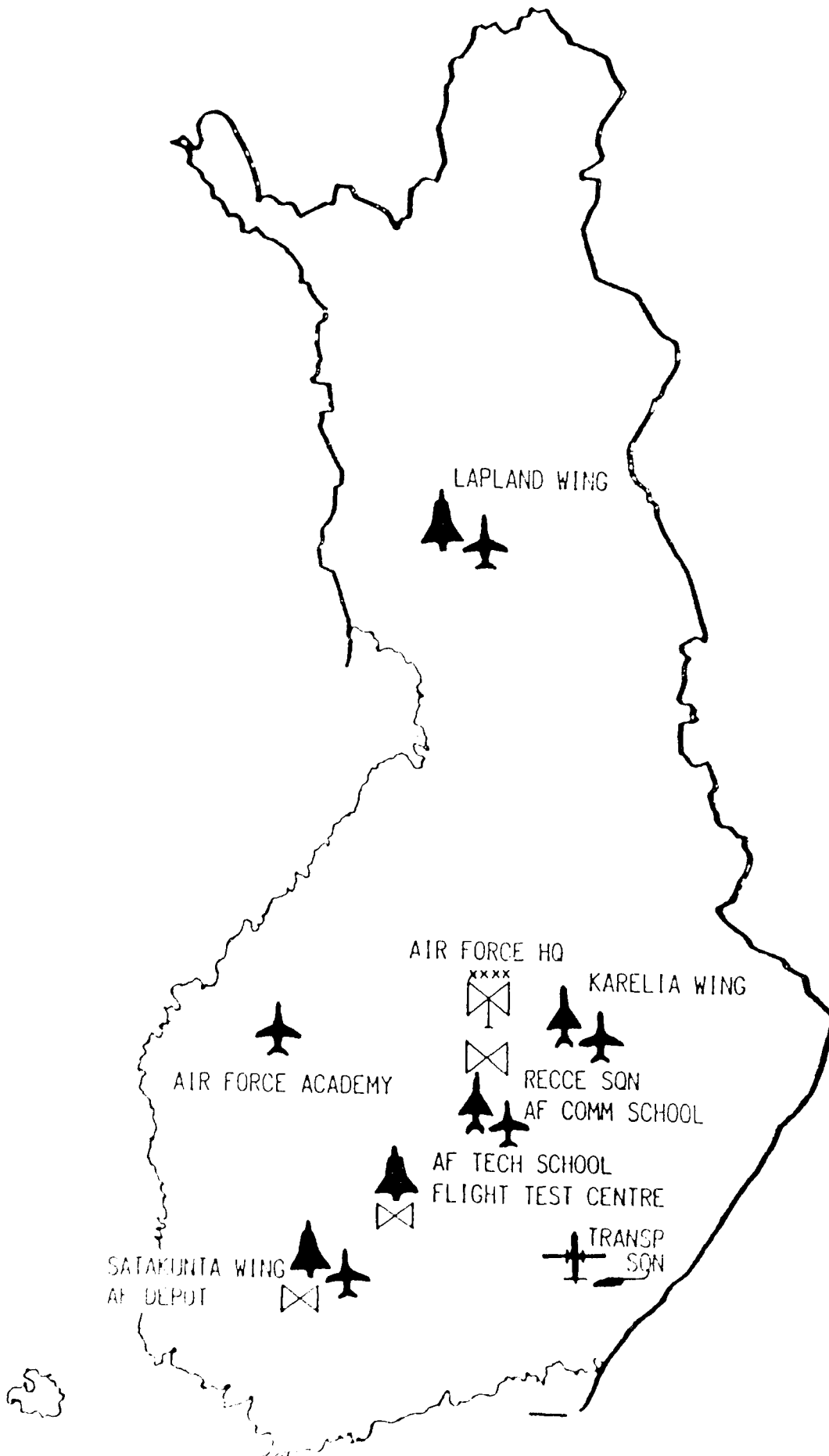
THE FAF: CURRENT STRUCTURE AND MISSION

According to the Paris Peace Treaty of 1947, Finland is allowed no more than 60 combat aircraft, none of which can be bombers. Peacetime personnel strength is around 2,500, of which roughly half are conscripts performing their national service. The FAF comprises a general headquarters, three air defense wings, one reconnaissance squadron, and one transport squadron. In addition, the FAF operates a flying school for air force cadets, technical and communications schools, and an air force depot (see figure 1).

The most important combat element in the FAF is the air defense wings. Each wing (one each covering northern, southeastern and southwestern Finland) maintains one fighter squadron, a radar network, and antiaircraft troops. Two squadrons--the 11th based at Rovaniemi in Lapland and the 21st stationed at the Satakunta Wing near Tampere--operate J-35 *Drakens*, while the third, the 31st squadron based at Rissalo in Karelia, flies Soviet-built MiG 21bis *Fishbeds*.

The Finnish Air Force possesses approximately 25 MiG-21bis and 35 J-35F/XS *Drakens*, reflecting a Finnish tradition of mixing purchases of weaponry between Soviet

FIGURE 1
THE FINNISH AIR FORCE



and Western sources, in order to demonstrate the "evenhandedness" of its neutrality policy and to avoid becoming too dependent on either side. Although the FAF has been flying MiG-21s since the early 1960s, the more modern, all-weather "bis" version has only been in the FAF inventory since 1978. Interestingly, the Finns strip all Soviet avionics, save the radar, from their MiGs upon receipt and replace them with indigenous electronics. This is because FAF aircraft often use civilian airports and must therefore have communication, navigation, and landing systems that are compatible with the Western equipment used throughout the country.

The Draken is a Swedish-designed all-weather interceptor and first entered the Finnish Air Force in the early 1970s. The "F" version are ex-Swedish Air Force J-35s, whereas the "XS" were assembled in Finland by Valmet and delivered to the FAF beginning in the late 1970s. Like the Fishbed, the Finnish Draken has been heavily "indigenously sized," with different avionics from its Swedish counterpart.

The main armament on the MiG-21bis is the Soviet-made AA-2-2 *Advanced Atoll*, termed the R-60 by the Finns. The AA-2-2 is a radar-guided, short-range air-to-air missile. The FAF also have an infrared, heat-seeking version of the Atoll in its inventory. FAF Drakens are equipped with the RB-27 and RB-28 air-to-air missile, which are Swedish-built versions of the old Falcon missile (radar-homing and infrared versions, respectively). More recently, the Finns have begun buying the AIM-9L "all-aspect" Sidewinder for its Drakens. Both the MiG-21 and the J-35 are also armed with internal cannons.

One drawback with the J-35 is its limited number of hardpoints--one on each wing and two on the main fuselage. However, since most FAF Drakens carry two external fuel tanks, this leaves room for only two missiles. The air force, however, has plans to add two additional hardpoints beneath the plane's air intakes.

Although the peace treaty strictly limits the number of combat fighters in the Finnish Air Force, the Finns have unilaterally interpreted the treaty as inapplicable to trainers or reconnaissance aircraft. In the early 1980s, therefore, the FAF took delivery of 50 British Aerospace T.51 Hawk jet trainers (most of which were assembled in Finland), a large number for such a small air force.¹ Each FAF air defense wing maintains a flight (approximately four to five) of Hawks, which in peacetime are used for operational air combat instruction and reconnaissance. Although the Hawk is primarily an unarmed trainer, it can be outfitted for light combat, and the Finns freely admit that they have bought gun pods and Matra rocket launchers, which they can use to convert their Hawks over to wartime use. Oddly, the FAF does not equip its Hawks with the AIM-9 to give them an

¹Four Hawks have since crashed.

interceptor day fighter capability, although the Royal Air Force employs its own Hawks in such a role.

In addition, the air force has several old J-35B and two-seater J-35C and Mig-21UM operational conversion aircraft, which could theoretically be converted for combat (although the J-35Cs have no hardpoints for external weapons stores). Hence, the FAF can probably mobilize up to 110 combat aircraft in a crisis or wartime situation.

Each air defense wing operates out of one main airbase, each with a headquarters, repair facilities, and hardened shelters--some of which have been blasted into solid rock. Point air defense is provided by army air defense troops equipped with antiaircraft artillery and manportable surface-to-air missiles (Soviet-made SA-7 and SA-14 SAMs) and will be supplemented by the purchase of the French Crotale medium-range SAM system. In addition, each wing has at its disposal several secondary airfields--including civilian airports and hardened highway strips--to which it can disperse in wartime, greatly enhancing both the survivability and the effectiveness of the FAF. Many of these secondary bases maintain permanent military support personnel, aircraft hangers, and stored fuel.

The FAF's reconnaissance squadron is based in central Finland, near Jyväskylä. It operates a flight of eight Hawk jets and a handful of MiG-21s shared with the 31st fighter squadron. The transport squadron, located at Utti, operates three Fokker F-27s, three Learjet 35As and Mi-8 Hip, and Hughes 500D helicopters. The Learjets are also outfitted with an integral belly radome, digital sea search radar, and other electronic sensors, and are used for surveillance tasks.

The primary mission of the Finnish Air Force is airspace surveillance and protection. Hence, the FAF operates almost entirely in an air-to-air role. In peacetime, this includes the patrolling of national airspace, identification of possible violators, and interception and deflection of actual intruders. Each air wing keeps at least one fighter aircraft on quick reaction alert at all times, every day of the year. Depending on the level of readiness, a plane can be airborne within three to 15 minutes. In addition, the air force regularly practices fast turn-arounds for its interceptors. The author witnessed one such exercise, in which a Draken was refueled, rearmed and ready to take off within six minutes (and this using conscript ground personnel). Once in the air, FAF aircraft are generally no more than ten minutes from the Finnish frontier, often less if based at secondary airfields.

On average, Finnish interceptors scramble around 100 times a year to investigate possible intrusions on national airspace. Of these, around ten percent are actual violations, and about one-third of all violations are made by Soviet aircraft.

In wartime, the FAF, along with army air defense units, would be responsible for denial of Finnish airspace to hostile forces. This would include the protection of Finland against enemy air attack and preventing the use of national airspace for transit by foreign aircraft and especially by low-flying cruise missiles.

Finally, each air wing performs a much smaller mission of supporting ground forces in its operating area. For this role, armed Hawk aircraft would probably be utilized.

PILOT TRAINING AND MAINTENANCE

The FAF maintains an air academy at Kauhava that provides basic pilot instruction and jet training for all air force flyers. Student pilots begin their flight instruction on the L-70 Vinka, an indigenously produced prop trainer, graduating up after one year to the BAe Hawk. After four years at the academy, a fighter pilot is then assigned to one of the air wings, where he continues training on the Hawk in operational air combat and then, finally, on either the Draken or the MiG-21 (depending on which aircraft the wing operates) for fighter training. All in all, it can take up to seven years before a pilot is qualified to fly intercept missions (see figure 2).

An FAF fighter pilot flies an average 200 hours a year (Hawk and Draken/MiG-21 combined), which compares favorably with the NATO minimum of 180 annual flying hours for its air forces. In addition, pilots receive additional training on flight simulators, which are maintained at the three air wing headquarters.

So far, too, the Finnish Air Force has avoided the problem of pilot retention which has vexed many NATO air forces as of late. Part of the reason is that FAF pilots must sign a ten and a half year service contract, for which they have to pay a 100,000 Finnmark (approximately \$25,000) penalty should they decide to break it. In addition, Finnair, Finland's civil airline, has an unofficial understanding with the air force that it will not accept commercial pilot applications from FAF pilots before their contracts have expired.¹

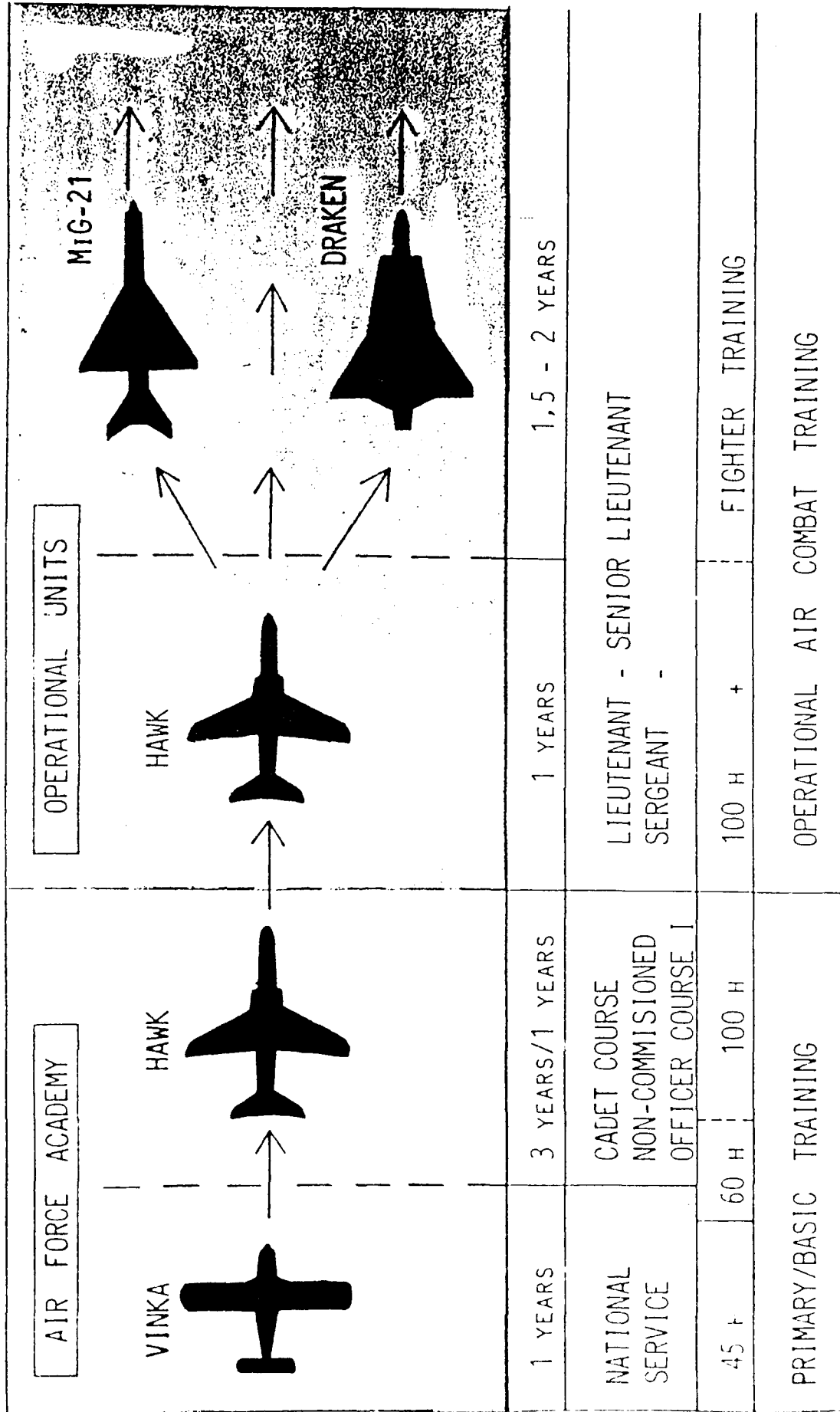
The FAF, therefore, can draw on approximately 150 pilots. This large pool also permits the air force to greatly expand the number of aircraft it can put in the air in wartime.

Aircraft maintenance and repair is totally indigenous. It is long-standing Finnish policy not to allow foreign military advisers on its soil. Hence, when new equipment is purchased from overseas, Finnish maintenance personnel are also sent to the providing

¹This can be illustrated by an incident that occurred last year. In Spring 1988, around 50 FAF pilots applied to Finnair's commercial pilot course. They were rejected on the grounds that taking pilots away from the air force would jeopardize the FAF's ability to carry out its duties, a practice that was upheld as legally acceptable. In response, approximately 10 to 20 FAF pilots contacted the Scandinavian Airline Systems about entry requirements for SAS.

FIGURE 2

FINNISH AIR FORCE FLYING TRAINING SYSTEM



country for training; they, in turn, train other Finns. Furthermore, if a foreign system cannot be repaired in Finland, it is sent (sometimes with Finnish personnel) to the manufacturer in order to be fixed, despite the added expense.

PROBLEM AREAS

At the same time, several problems confront the FAF. The most critical is a shortfall of combat aircraft necessary to effectively patrol and defend Finnish airspace. Finland is a large country, 337,000 square kilometers in area. It must also guard over 2,500 kilometers of land frontiers, nearly half of which is shared with the Soviet Union. With only 60 front-line combat aircraft, this is a monumental task. Hawks may help a bit, but they are relatively slow-moving, and, lacking air-to-air missiles, they would be flying cannon-fodder up against more advanced combat aircraft or sophisticated air defenses. In addition, the air force's Drakens and MiGs are being increasingly met with an upgraded threat, such as MiG-29s, MiG-31s, Su-27s and Backfire bombers deployed on Soviet territory adjacent to Finland (or, for that matter, F-16s based in North Norway or U.S. carrier-based aircraft stationed in the Norwegian Sea).

Furthermore, due to the constraints of the Paris Peace Treaty, the FAF lacks *any* attrition aircraft. If a J-35 or a MiG-21 crashes, the air force must buy another from the Swedes or the Soviets rather than replace it out of stores. While this may be permissible in peacetime (and the Finns have been helped by a very low attrition rate for its Drakens and Fishbeds), losses during wartime could quickly deplete the FAF.

The FAF is also deficient in modern, air-carried munitions, particularly for all-weather interception. Although the Finns will not release figures on the numbers of air-to-air missiles in their inventories, since they have only recently begun buying the AIM 9L it is likely that FAF Drakens still rely heavily upon their Falcon missiles, which are notoriously ineffective and increasingly obsolete. Even then, the Sidewinder--a heat-seaking missile--is not an all-weather weapon. Moreover, the Finns have few air-to-ground weapons, and the FAF does not even possess simple iron bombs. Finally, there is also a need for more modern avionics on their aircraft, including heads-up displays (HUDs), electronic countermeasures (ECM) and electronic counter-countermeasures (ECCM). While many of these problem areas may not be serious at the moment, as the FAF progresses through the 1990s, they should become increasingly disadvantageous.

FUTURE PLANS

By far, the biggest future plans in the Finnish Air Force is the replacement of its *entire* combat air fleet sometime in the 1990s. By the middle of the next decade, most of the

FAF's Drakens and MiGs will be approaching 20 years old, making fatigue alone a sufficient enough reason for their retirement. The air force has a requirement for an interceptor with a true look-down/shoot-down capability, in order to destroy low-flying cruise missiles. In addition, it must be able to operate from rough runways or highway strips.

Currently four aircraft are under consideration: the MiG-29 Fulcrum, the F-16, the Mirage 2000 and the Swedish JAS-39 *Gripen*. Although no official go-ahead has been given, a final decision as to which aircraft will be bought could come as soon as next year, with orders placed by 1993 and deliveries beginning around the mid-1990s.

The two current favorites are the JAS-39 and the MiG-29. Until recently, the Gripen was probably the strongest candidate. The Finns have historically had a very close relationship with their fellow Nordic neutral, and this has been reflected in their purchase of a large amount of Swedish armaments (such as the Draken). The JAS's air defense capabilities correspond closely to the FAF's future intercept missions, and it is well-suited to operating from highway strips (meeting the FAF's policy for increased wartime dispersal of aircraft). However, some have voiced their concern that the Gripen may be "too much plane" for the Finns, who do not have a high requirement for the JAS's air-to-ground capabilities. In addition, the Gripen is currently over-budget and years behind schedule, and with the crash of its prototype last February it is no longer the clear leader.

At the same time, the Finns have a tradition of buying Soviet aircraft, and the MiG-29 also meets many of the FAF's operational requirements. There are also strong economic pressures for a MiG purchase: The Finns have a \$1 billion trade surplus with the USSR, and since Fenno-Soviet trade is based on a barter system handled through each country's central bank, this is "lost" money for the Finns. There is an incentive, therefore, for purchasing the MiG-29, and it is estimated that a purchase of 30 Fulcrums could wipe out half of this trade surplus. In addition, the Fulcrum's poor avionics should pose no great problems, as the Finns would probably replace these anyways.

Besides new combat aircraft, the FAF has other equipment requirements. It wants to buy ten Valmet Redigo trainers and 12-30 additional Hawks. Most of all, however, it has a great need for advanced air-to-air munitions. The Gripen, for example, is designed to fire medium-range missiles, either AMRAAM or the British Active Skyflash.

CONCLUSIONS

Many expect that the FAF will continue its tradition of dividing its aircraft purchases between Soviet and Western equipment. If so, then the purchase of 20 to 30 MiG-29 Fulcrums is almost a certainty. However, it is no longer assured that the Finns can afford

to buy two different combat fighters. Purchasing 30 each of two different planes, as opposed to buying 60 of only one type would likely drive up per unit costs, as well as increasing maintenance and operational costs. At the same time, the FAF refuses to give any hints as to the possibility of a split buy to preserve its bargaining position with the Soviets.

It is by no means certain that the FAF will be allowed to buy new combat aircraft, however. Whereas few Finnish politicians may oppose the proposed buy, it is not yet clear where the money will come from. The purchase price of 60 fighters is estimated at between six and ten billion Finnmarks (\$1.4 billion to \$2.4 billion), spread out over a ten-year span. That, however, adds up to around *half* the total Finnish budget for defense acquisitions for that period.

Even though Finland spends only about 1.5 to two percent of its GNP on defense, it is unlikely that this figure will rise much in the near future. Therefore, the costs of new aircraft will probably have to be borne out of the existing defense budget structure. This means either cutting into air force operations or else squeezing the Finnish Army. The Finnish ground forces, however, which were promised a major, 15-year procurement program in the 1980s (see figure 3)--a program that, incidentally, is already a billion Finnmarks behind schedule--are unlikely to accept further delays in their modernization program in order to allow the air force to buy new planes. There is also growing political opposition to such an expensive arms purchase--mainly from the left, which argues that since "no threat is aimed at Finland," there is no need for replacing existing fighters. There are also criticisms that Finland should not be rearming while the rest of Europe is talking about reducing military forces.

It is likely, therefore, that the FAF will have to soldier on with its aging fleet of Drakens and MiG-21s. With upgrades and other modernization, these planes could probably be kept flying throughout the 1990s. By the turn of the century, however, the intercept capabilities of the FAF could be greatly weakened, leaving the Finns with a serious credibility problem for their neutrality policies.

Finally, longer-range air-to-air missiles present a potential *political* problem for the FAF. Flying as it does under a strictly defensive operational doctrine, it could be a sticky situation for the air force to even possess the capability to engage enemy aircraft far beyond national airspace. At the same time, such weapons are necessary to enhance the combat effectiveness and increase the survivability of its limited number of interceptors.

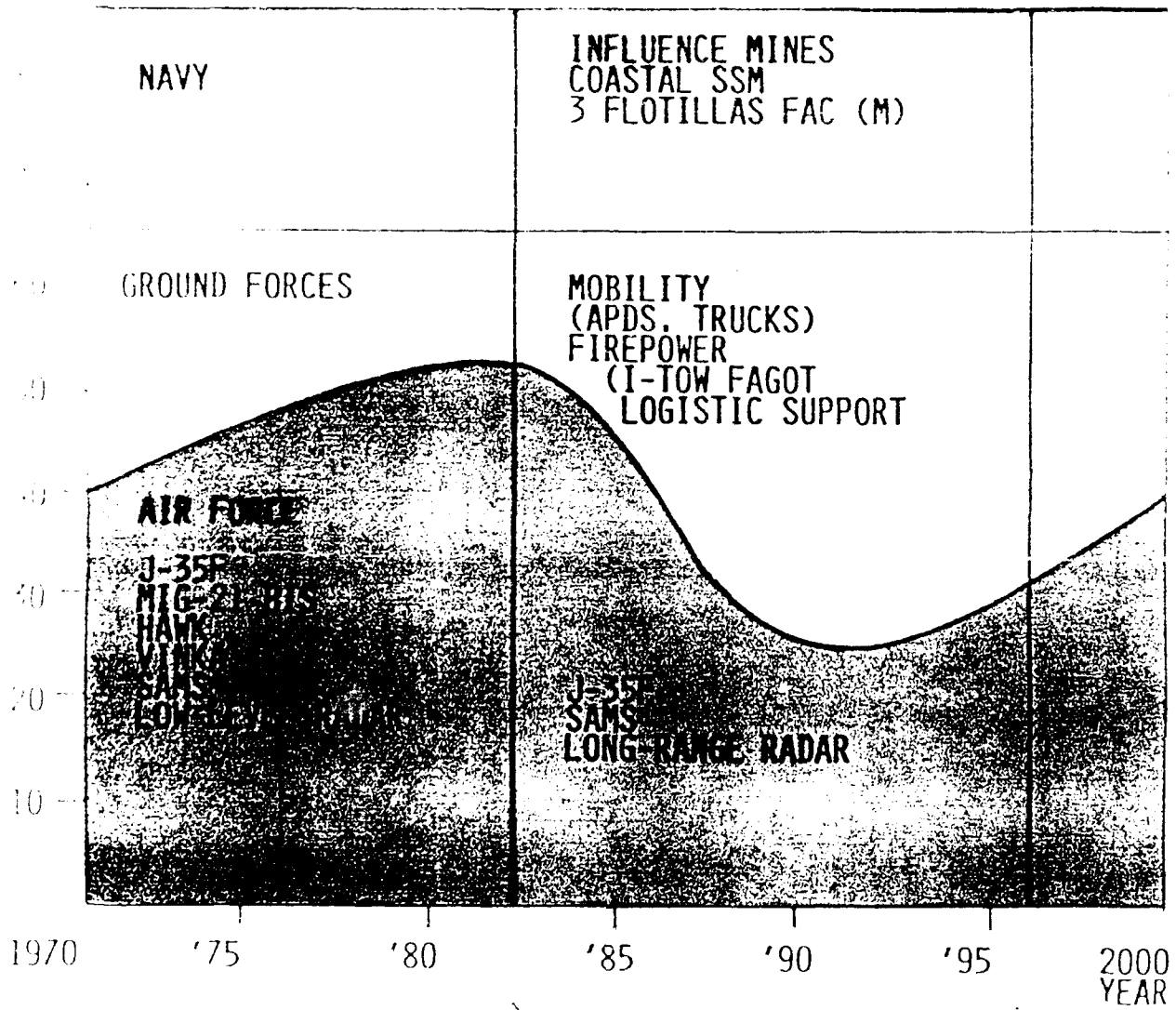
Even with new aircraft and advanced munitions, the factor of the small size of the FAF would remain a problem. Sixty interceptors can only go so far, and, given the large potential force confronting it, it is doubtful whether the air force could effectively cover

FIGURE 3

ANALYSIS OF THE DEFENSE BUDGET 1982-1996

DEFENSE BUDGET

COMMON ACQUISITIONS



PERIOD COVERED BY THE THIRD PARLIAMENTARY
DEFENSE COMMITTEE 1982 - 1996

more than one area of action at a time. Hence, the FAF would still be hard-pressed to deny Finnish airspace to an invading or transiting force. In addition, it is entirely possible that much of the FAF could be destroyed early on in any conflict, perhaps even if it is able to disperse its air operations.

In the end, some kind of outside help during a major conflict may be necessary after all, and, in fact, it is altogether possible that Sweden could offer some assistance to the Finns. For one thing, Swedish security is highly dependent upon the continued neutrality of Finland. In addition, Sweden, with its great emphasis on airpower, possesses an air force of over 500 combat aircraft--the third largest in Western Europe. It is not inconceivable, therefore--although it is an absolute certainty that nothing formal has been prearranged and although both sides would probably deny the possibility of even a tacit arrangement--that the Finns might turn a blind eye and permit Swedish warplanes to carry out air intercepts over Finnish territory, particularly in the north and Lapland.

Still, all in all, the FAF does a very good job with what little it has (or is allowed). Compared with Norway, for example--a fellow Nordic nation with roughly the same population and size--the Finns field a comparable air force and, what is more, do not have the same pilot shortages that the Norwegians have. In addition, the Finns have one of the highest per capita ratios of combat aircraft in Western Europe--higher than even West Germany or the United Kingdom.

The Finns have always shown a very high defense resolve. This is reflected in their sense of national identity, their fierce independence, and their strong support for defending their country militarily against all invaders. This resolve, however, is being increasingly challenged by a host of political, technological, and fiscal pressures. During the next decade, as the Finnish Air Force attempts what is perhaps its most ambitious modernization program to date, all these factors will test the military dimension of Finnish neutrality policy.