INTERVIEW WITH FREDRIK ENGSTRÖM

Conducted by Nina Wormbs

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Revised Transcript
NW: This is an interview conducted by Nina Wormbs with Fredrik Engström. We are planning to do this in three parts. I would like to start with a short biography; after that we will talk about Swedish space history, the 70s and 80s, which you are best acquainted with, and we will end by talking about your time spent at ESA.

FE: I was born in Karlskrona in the south of Sweden.

NW: What is your background?

FE: I studied physics, mathematics and astronomy at Stockholm University and wrote my thesis on astronomy. I started to work on space when I was a student at Stockholm University. They were looking for students to participate in the first launchings of sounding rockets in Sweden. This is how it all began. I did that for some time. I almost left space to go into another area, because I was offered a post at the European Southern Observatory in Chile, as boss – I was very young then – but I didn't take up the offer. I went instead to Culham Laboratory in the UK, which was a centre of excellence for fusion research. They had a division which was working on natural plasmas and that meant we were basically working on the Sun. I was there on an ESRO grant. I was very young at that time. So I went to the Culham Laboratory, which had just been set up, and worked on their sounding rocket programme. And I launched rockets from Australia. I did this for three to four years and wrote my thesis on the corona temperature.

NW: Are we talking about Woomera?

FE: Yes, Woomera. I started at Culham Laboratory in 1965 and left in 1969. I was there for several launches, the last being in 1969. That was my career in the laboratory. And it was on those experiments from Woomera that I did the thesis, but during that time I started with the Space Technology Group. The two bosses, Lennart Lübeck and Lars Rey, left and so they called me in, and then one thing led to another, the Space Technology Group, the Swedish Space Corporation up to 1985, and then ESA, first as Director of the Space Station [and Platforms] and then as Director of Launchers.

NW: That means that you have been involved in space for most of your career?

FE: Yes, I have done almost everything, all the applications programmes, telecommunications, Earth observation, microgravity, launchers, astrophysics, you name it.

NW: If we concentrate on the Swedish programme beginning in 1972, when the SSC was created...

FE: 1972 was a dramatic year. ESRO was instrumental in us starting up the Swedish Space Corporation, which was a big step forward into the space era in Sweden. We were able to do this by taking over Esrange, which we used to create the SSC. Esrange was the absolute key to getting started and so, beforehand, we planned to get Esrange operating at the third of its cost at the time, or something like that, and we successfully managed to do that. Then we started with the Swedish Space Corporation. At the same time the Swedish Board for Space Activities was created. These were hectic years for Klas Ånggård and me, but we were happy to be left to get on with things, as this gave us flexibility. I remember very well when, for the first time, I had to present a programme budget to the Ministry of Industry and we had no clue how to go about drawing up such a budget. The task took us three days, but we did it. I think those budget principles still stand.

NW: When would you say was the tipping point in terms of Swedish politicians switching from being very reluctant about space to being pro-space?
FE: I think it was in 1972, the year of the Ministerial Conference at which Sweden joined all the applications programmes. This was a surprise, even for Jan Stiernstedt, I think. There were three programmes: telecommunications, Earth observation and launchers. We joined all of them. We used an argument that was somewhat different from the arguments used by the rest of Europe. First of all, to get Swedish politicians moving, the argument had to be an industrial one.

NW: Not a research one?

FE: No, but it had to be applications oriented. On the launcher side, it had to be very politically oriented, so that we never said anything on the lines of wishing to explore the unknown. The argument was that it would be good for industry and for Sweden, because we would get all the industrial contacts. On the research side, it would be beneficial for a small country like Sweden on the edge of Europe to establish networks all over Europe. It was what Sweden needed and at the same time, as we can even see today – we are still not part of the euro zone – it was quite something to get into the Union… and there was also the politics, the neutrality and balancing. So we sailed with that tide and used the arguments adapted to the Swedish situation. We were enthusiastic.

NW: So, do you think that played a part in managing to have the ear of politicians?

FE: I think so. We argued smartly on the points that they would listen to. If we had gone for the usual "discovering the unknown" line at that time, Sweden would not have been receptive; the political scene was a very pragmatic one.

NW: Did you have any support from industry?

FE: Oh yes, they were all for it! Both Saab and Volvo were very enthusiastic. At Saab, there was Tore Gullstrand at the time. The issue went right up to the President of the company, Gustavson. They had very big plans… although I’m possibly mixing up dates… but I do know that when we negotiated the Ariane deal, for instance, Yves Sillard who then headed CNES, said, because Saab were interested in the computer: “That’s impossible, how can I trust Saab, they haven’t shown us what they can do?” In the end, he said: “OK, I will test you, you put up SEK 500 000”, which was a mind-boggling sum for me, “work for three months and then come back and we will see.” And Saab actually did that, which I thought was impressive because we really were in uncharted territory. In parallel, Volvo Flygmotor had negotiated with Frederic d’Allest, who was second in command at CNES, without me knowing about it, though I got to learn of it. They used their own political strengths to successfully place their contracts with Volvo Flygmotor. Eventually, we got both Saab and Volvo Flygmotor onboard. They achieved a great deal and, in the case of Volvo Flygmotor, I think they realised there were obvious benefits, especially the argument that is even more valid today, which is the importance of the relationships you form with other firms. You develop a relationship here which is comparatively limited economically speaking, so although there are high risks technically, the firm would not go bust, which means you develop and become confident and that is contagious. I believe both firms made very good choices because they are still in business 35 years later in the same area. Yes, they were very supportive, including from the political standpoint.

NW: You mean it was an important industry for the politicians?

FE: Yes, they lobbied for it. There was always a bit of competition, but on the whole they were very supportive.

NW: What about Ericsson?
FE: Ericsson had a much lower profile and always has had. Ericsson did not invest in space. They also suffered from the fact that their Technical Director never believed that satellites could be used in communications due to the half-second delay. I think this hampered them. He was always very supportive and enthusiastic, but did not believe in space communications. Their money was on the ground. Ericsson’s structure as a whole was different and, at that time, intimately connected with the Swedish post office and telecommunications service. Their customer was the government. You could say the same for Saab, but they (Ericsson) were more integrated with the government and so were more cautious and, I would say, safeguarded their main business. That changed with mobile phones and maybe the situation is again different, but at the time the Swedish post office and telecommunications service formed a state within a state. They were really powerful and did whatever they liked.

NW: But Volvo and Saab were the big industrial players?

FE: They played well. I believe what was also important for Saab was that they were already in a consortium. I mean they knew there was competition. Saab was quite a powerful company, they built their own aeroplanes, and there were not that many people around doing that, so they were also in favour of this consortium and they were very close to TRW and the Americans. I think that attracted them to broadening their base. Saab's dream at the time, which did not materialise, was that they should be able to compete on an international market. To be part of this effort meant that they could be on the German or European market. They felt they were the greatest in the world but I thought they were the greatest in Linköping and as regarded space they still had a few things to learn. They were not bad. They thought they could build up an enormous business if they were allowed to compete in Europe. They were enthusiastic and they were confident.

NW: Now, coming to the period 1972 to 1985, which were the most important decisions, both from the government's point of view and from that of the Space Corporation? I know the two are connected because you lobbied quite effectively for government decisions. When did you start attracting attention to what you wanted to do?

FE: When people and industry all of a sudden listened to me, they thought I was crazy, especially my board. It was at that time that we were thinking about direct TV satellites. It must have been in 1974; there was a 4-page memo involved – because of the Nordsat issue. Unfortunately, in a way, we were about 15 years ahead of the rest of the world. I went to Japan and to the USA, I talked to Hughes, I talked to everyone at Hughes and they were actually right in there from the start. That was when it started and we then fought our way through the cultural mafia and their statements to the effect that rubbish was rubbish even from satellites. We came up on the radar screen for the government and, with everything that happened, there was merit just in doing something which was perhaps not European but Nordic. Sweden has for 50 or 60 years tried to achieve something on a Nordic scale but has always failed – there was the Volvo affair. The Nordic scale was always the objective. This is why we did Nordsat, but Nordsat was yet another big failed Nordic idea and so we went on to create Tele-X and I think that taking the Tele-X decision in 1979...

NW: 1979?

FE: Yes, I have just read in Swedish Space Corporation, 25 years, 1972-1997, that the budget was SEK 1250 million, but I also recall that we actually had SEK 150m or SEK 200m less than that. I remember how this figure came up. We had said Tele-X would cost SEK 800m. I was sitting on a plane to Helsinki with Thomas Sidenbladh from the Ministry of Industry and thought to myself: “I can’t do it for SEK 800m. Our estimate was SEK 1500m, but that is too much, I cannot sell that politically, but we concluded that SEK 1250m was sellable.” After that, I went with my pack of viewgraphs to the ministry and said SEK 1250m. We actually
did succeed in designing to that figure, but it took a lot of work and ingenuity. As I said, budgets and planning are only there to have something to compare. Anyway, that was how we started, the “tolerance” was acceptable and Swedish firms, especially Saab, were able to build up a network of contacts. Saab had a large amount of industrial work; they created Saab Space, and so on. In retrospect, the Tele-X decision enabled us to get our foot in the door, as it led us working on Viking.

NW: What do you think about the Viking satellite? What sort of impact did it have? Was it a trial?

FE: I suppose Saab were not at the time that pleased with the way we went about things – I’ve mentioned the story about the SEK 1500m versus the SEK 800m. One had to be very pragmatic in dealing with the situation and we embarked on the Viking satellite to learn how to operate. Again there was a lot of money at stake. That was when I went to Boeing and told them what we were going to do. Boeing went along with that and sent over a team. They had an exceptional Director who was very forceful in getting his point of view across. Anyway, Boeing took an approach that they felt they could justify and we brought together Swedish industry, above all Saab, and Boeing. Boeing was a very impressive company. So we completed that satellite for about SEK 150m, which was half the cost projected when we were with Swedish industry. I felt very uneasy about the SEK 300m figure, as this was a large amount of money to put on the table, and we had to succeed. We had to be very pragmatic and the Saab role was diminished. However I do think we learnt a lot. As we can see, the Swedish Space Corporation have achieved a great deal and they are still building satellites at low cost. Sven Grahn was systems engineer. We did that as a warm-up for the big jump.

NW: If you were to mention a few people – you were talking about the “cultural mafia”, but also a kind of a general resistance that you overcame – in this more general culture of ideas about putting money into space or not, can you name any people who were more important than others, who made a difference?

FE: Jan Stiernstedt, Hans Håkansson and Lennart Lübeck were very influential or important at that time. Lennart Lübeck was a space fan anyway, Jan Stiernstedt became one, he hadn’t known anything but I think he thought it was fun.

NW: I think so too.

FE: And I was the type that he had never met before in his life.

NW: What about Hans Håkansson?

FE: Hans Håkansson made things happen, he was an éminence grise, he created the Swedish Nuclear Programme single-handed. He once approached the Minister of Finance, who said: “Where are we going to take the money from?” The reply was: “We should tax electricity” – 2% – and the trick was done! That is how the Swedish Nuclear Programme started! I fought a lot of the battles but they did the internal work, putting the proposals together in presentable form for submitting to the Social Democrat government. When the government changed in 1976, it became in a sense easier, because there were so many crises going on in Sweden on the industrial front. We used a lot of arguments that fitted the situation, and we did the same in 1976. Industries were collapsing, the shipyards were closing down and the new Saab aeroplane was cancelled, but we proposed Tele-X and Viking and investments in space which gave the government the opportunity to show that they were very much in favour of technology and future industrial structures. The Ministry of Industry people who were most helpful were Sidenbladh and Lübeck and later on the Minister Nils G. Åsling and Bengt Westerberg [finance] but there was even a few individuals at the Ministry of Finance who were helpful. I am referring to Bjorn Ericsson, who later became Director General of Customs
and Landshövding [Governor]. He was Head of Budget. Sidenbladh and I approached him and suggested we write a bill to the parliament. He was the person who had the specific job of saying no to everybody. Yet he said yes! But the lines of communication I had into the government through Jan Stiernstedt and Hans Håkansson were very important. Stiernstedt was a member of the Social Democrat party and was also very close to Palme, as was Hans Håkansson.

NW: So networks are important?

FE: Yes, someone like Jan Stiernstedt was able to work by instinct. I recall sometimes talking to him, he would say nothing, yet I would be prompting him with talk of our plans. He had a manner of being very silent and that’s the way it was. I knew that the long silence meant that the idea was not a good one, but that he could not tell me why because he was not allowed to tell me why.

NW: What about Earth observation, when did that get on the map?

FE: We shall take the space segment first. Olof Johansson was Minister, at the time of the Ministerial Conference in Paris in February 1977 at which the French proposed SPOT to Europe. Mr Johansson, who attended virtually none of the meeting because he had other business to do on the nuclear side, had to read a statement expressing full support for the SPOT programme and saying that Sweden should join. (We had written that). He said afterwards that he was a little surprised that Sweden had been alone! We at the SSC were very much in favour of remote sensing. I don’t remember when we created the ground station for Earth observation [beginning of the eighties]. That was a decisive event. ESA announced that they were going to have a ground station for receiving data from the Northern region, because all the orbits would be covered. I didn't have any funding, Håkansson said: "Let us take a decision at the SSC board and then announce it to the press." That is what we did. We took a decision in the board and then issued a press release, but the press release did not render the full decision of the board. We took the decision in the board and said: "The Swedish Space Corporation has decided to create a satellite station in Kiruna." The Director (me) was tasked with working out the funding for it – that was left out of the press release. So, we went out to the world. There was fierce competition from Norway. They had money. Then we put our proposal to ESA. We had a very nice package, with the investment cost charged to ESA (the running cost was not a problem) as part of the overheads, a small one because we had fixed it for a very long time. But I recall sitting one afternoon with an ESA legal adviser who said that this was not allowed, that we could not charge the investment costs to the Agency. (It was Winfried Thoma). I was not sure what to do. That was when we came up with the idea of leasing. It was a brilliant concept. We drew up a leasing contract and leased the station and paid no investment costs. There were the financial costs of setting up the station, which was normal, but no investment costs for ESA. So we got the contract. We created a new company, Satellitbild. We put the control station for Tele-X and Spot together at Esrange, so we had Landsat, SPOT, Tele-X and Viking. We drew up a new business plan which is still going strong and now part of an international network with SSC stations all over the world that is a successful commercial operation.

NW: How important in Swedish politics do you think is the deal of placing this station in Sweden? Kiruna is a politically important city.

FE: You use the arguments that are relevant, and I am not sure if they care about those today as the price of iron ore has gone through the roof. At the time it had not, but it was not just that, it was clearly a great advantage to set it up in Kiruna. Otherwise I do not think that I could have got the enthusiasm going. I do not think, as I have said, that it is of great economic significance. However, to have a high-tech facility, that was not part of the mining industry,
was important. Sweden is on the edge of Europe, and Kiruna is on the edge of Sweden, so it’s far away, and to set up what was, communication wise, a worldwide activity was and is important for the local community. They have maybe only 300 employees, but for the region and the town of Kiruna it is important. It gives people in Kiruna an option other than going to the mine. So, Kiruna Geophysical Institute and the Swedish Space Corporation were set up locally with the daughter companies. I think we were there first, and today you can see how they are bringing in data communications, Lantmäteri [landsurvey], etc.; all this is coming to Kiruna because people realise that North or South are irrelevant, the communications picture being what it is. But we thought and argued like this very early on. We set up almost everything there with virtually no money, but, regarding the creation of the Swedish Space Corporation, if there had not been Kiruna, I do not think we would have been successful. If we had not had European investment in Northern Sweden we could not have done anything in Kiruna. Had Esrange closed down after SEK 50m being invested in it, I would have looked very bad and indeed it would have been a black mark against the government.

NW: Looking back, do you think there were any missed opportunities?
FE: There must be lots!

NW: Are there any decisions you regret?
FE: Yes, lately, there have been. You always think that you could have been more clear-sighted or more flexible.

NW: Let’s talk about ESA, the first question would be why you moved there?
FE: I was at the Ministerial Conference in Rome in January 1985. A space station and Ariane were on the agenda and it was decided to start up those programmes and I realised that they were actually going to go ahead. At home at that time, the relationship between the Swedish Space Corporation and the Minister of Industry [Thage G. Peterson] was at freezing point. The post office and telecommunications service had arranged an audit because they claimed that I had hidden costs, when in fact it turned out that I had not. On the contrary! Anyway, they put me in a very difficult position and I was beginning to find these people tiresome. Then, all of a sudden it appeared that they needed a Director at ESA, and I applied. It was good timing, because at the Swedish Space Corporation a more technocratic, cool management, which was appropriate for that time, was emerging. Mountains had been moved and many of the difficult European turns had been made and we now had a long straight road stretching out in front of us and the question was how to keep the car on the road and maintain speed. The SSC people did a great job and a much better one than I would have done. I think I made a well-timed move. The last thing I did there was sell an oil-spill detection system to the Chinese. You know, the airborne surveillance system, it can still be found everywhere even now, coastguards in Sweden, Holland, in the USA use it. It is a business at the SSC today. I sold it to the Chinese. I went to Beijing where we negotiated for three or four days, whereas negotiations usually last three months. While I was there I received a phone call from Director General Reimar Lüst in Paris who said he would like to arrange a meeting. The meeting, at 7 or 8 o’clock on a Saturday morning in Paris, went well and I started on 1 October 1985.

NW: Which posts did you hold at ESA?
FE: I started in 1985 as Director of Space Station and Platforms and stayed in this position until 1994, when I became Director of Launchers.

NW: What did you find the most interesting?
FE: The International Space Station was a real challenge. This was before the accidents that slowed down the programme. It is at last coming together now, more than 20 years after the start of the programme. That is certainly too long; you should never have programmes that take that long. But I learnt a lot. ESA was a completely different world for me.

NW: How was it different?

FE: In every respect. To start with the good side, you had a big machinery of engineers, very competent people, you snapped your fingers and hey presto the work was done! There were lots of very clever people. They were well organised and whatever you wanted they could produce in no time. A German-English crew worked on the space station programme and they were excellent. They had the experience of Spacelab. They also knew all about the American way of working and so on. That was enjoyable. They always had solutions. The more frustrating aspect – and it took me some time to realise this – was that you might have a lot of influence, but in fact you took few final decisions yourself when it came to big decisions. All decision-making was complicated, there was manoeuvring, as there were the delegations and the other Directors. Lüst and Administration were just a joy to work with. Administration at that time was really supportive. I realised afterwards that I had proposed things that were firsts, such as an industrial proposal for 1.2-1.3 billion Accounting Units. This had never been done before, but we succeeded. Administration worked very well at that time.

NW: So would you say that politics was left to others?

FE: No, in my view the Director of an ESA programme, at least the programmes I was in charge of, a political programme like the space station, but also Ariane, has a political job. You have to understand what everyone is doing; you are there to sell the programme. The most important thing you do is sell the programme, all the time, all day, especially at Council and Programme Board meetings. You have to go and visit each delegation because delegations that are not visited feel left out, but when there are 16 delegations, that takes time! Just going round and explaining takes time. It is very time-consuming getting decisions through. I think that for the Director General it is even worse.

NW: From the Swedish point of view, what was Sweden's position compared to the other Member States?

FE: I think that, on the whole, the Swedish Delegation did not speak a great deal, but when it did it usually had something pertinent to say. Secondly, at the time I was there or when I was on the other side of the table, we participated in almost everything; we supported the Executive as a matter of principle. As it was a participant in most of the programmes and also was careful about its priorities, the Swedish Delegation was I think generally appreciated, at least by the ESA staff. The other countries, at least in my time and afterwards, certainly regarded us as pro-French, which we were, unlike in 1972 when I came in when we had been pro-British. I recall Håkansson's instruction to me when negotiating the new ESA Convention: “Remember, when you don’t know how to vote, vote with the Brits”- which we did. That changed somewhat, so that we became much closer to the French, bilaterally and so on. During the last few years, this has changed again. There are still strong bilateral ties with France but also now with Germany. It was a bit difficult for me at the time to be Director of the Space Station because Sweden was not then participating in the programme. You could say it was an advantage in a way because you could not be suspected of being biased. But it was a weak point in my view. Furthermore, towards the end of the 80s and the beginning of the 90s, Sweden found it more and more difficult to obtain funding for space activities from the government.

NW: Why do you think this was?
FE: Let’s say that after 1994-95 the arguments originally used had lost their force. You had the IT, you had the commercial side of space which was twofold: it was telecommunication satellites and launchers, and the launchers were, I would say, a semi-commercial business. We Europeans did well, but there was a lot of government effort behind it. Telecommunication satellites really became commercial. Earth observation did not need to be commercial, but it was obvious that it was good for humankind and that argument carries weight in Sweden. I remember seeing Carl Bildt when he was Prime Minister then and we discussed what Sweden should do and so on and he said that he wished to make a mark there and show that Sweden was interested in Earth observation. And Sweden went in with 4% or thereabouts. He was an enthusiast about high-tech and space. Otherwise the argument that space should be a major industrial sector in Sweden had disappeared. Defence is being dismantled. I think the argument in favour of Volvo Flygmotor being in the Ariane business is certainly still valid. All this takes time but interest waned. I still believe Sweden has a strong participation in the Science Programme and in Earth observation. However, extensive political influence was necessary to assert that Sweden should be in the Ariane programme for instance. There you needed political decisions because the bureaucrats didn’t see the value of it. At the highest level in Sweden they saw it.

NW: Is there anything you would like to add as far as your involvement in space is concerned?

FE: There have been a number of decisions taken lately in the launchers area that I did fight against, such as using Soyuz from Kourou. Maybe this was misplaced opposition. I can see what is happening, though, and the situation is as I predicted. To keep Ariane going, they have to subsidise it heavily. If the money used for that had been put into development work instead, then you would have got something out of it. One thing that I regret and that never materialised was that I proposed a policy for launchers in Europe whereby we should continue with Ariane but make it a family of launchers built using the same hardware, the same guidance system and the same electronics; you could thus develop a smaller launcher (a Soyuz type) at very low cost. Above all, you would have an industry that was kept together and was competent and did not cost governments a fortune every time there was a launch. What I worry about is that Europeans are going to lose faith in continuing to subsidise to such an extent, especially the smaller countries such as Sweden, and then the French will be left on their own. The UK is not in there anyway. The Germans are wondering why they should finance this, even if it is EADS that is involved now. The rationale is not an inherently sensible one, so in the long run it has become very difficult to argue in favour of it. The real cost of a launch is maybe €300 million, but unfortunately we can only charge €100m and thus need €200m in government support. It is difficult to keep enthusiasm going around such programmes. It will work for a few more years. I regret that my proposal was not taken up.

NW: What would have happened if you had stayed in Sweden given the liberalisation of the telecom sector?

FE: I don’t know. I probably would not have been good at fighting at the SSC astutely enough to keep the car going straight ahead on the road. I probably would have gone in some other directions to develop less dependence on government. There is a period after you have carried through a large programme when you have to reflect on what to do next. A couple of times, when I did not know what to do, I went out into the world and looked around. I went to Hughes, TRW, Boeing, the Japanese, to Aerospatiale. I went around and looked at what these people were doing, what they were thinking, and when I came home, I knew what to do.

NW: You learned from the big operators?
FE: Yes, you need to be open to what is happening elsewhere. When you are in project work, you do not have the time to read about what is happening in the rest of the world and in any case you can only learn so much from reading about what other people are doing. You need to go out and actually see people and be able to ask them why they are doing what they are doing and what they believe. Usually they will be very happy to tell you.