

Series - Satellite Commentary –

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The small satellite in the United States of America with the support of taste

My name is Tomoki Obuchi, Senior Editor of Space Japan Review. I am very honor to give the opportunity of the contribution, and I thought what satellite commentary it let's introduce

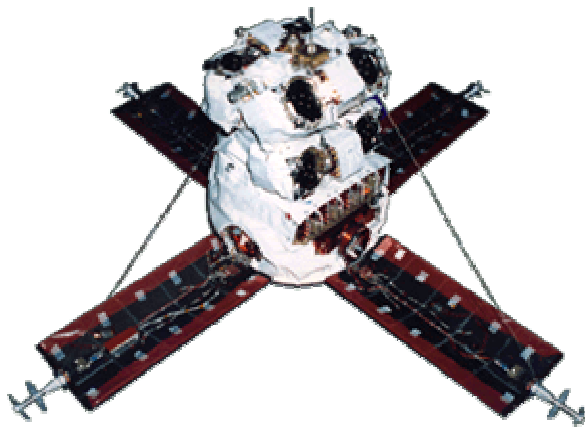


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but because the story having to do with too much history is my weak point, I think that it wants to introduce about the encounter with the small satellite.

The definition in the small satellite is shown in the special report by Dr.Rick Fleeter " A Survey of Some Contemporary US Micro satellite Missions", SJR 6-7, 1999,vol 15. The classification is as follows ; Small Satellite ranges from 100Kg to 1000Kg. Microsatellites are 10Kg to 100Kg, Nanosatellites are 100g to 10Kg.

It is well known by satellite people involved that the Japanese first satellite "OSUMI" which was owned by ISAS was launched in 1970, and the first satellite "KIKU-1"which was owned by NASDA was launched in 1975. It is the satellite, which enters to the classification of either of the small satellites, but at the time, not being yet, it thinks that the definition was classification by objective as like as the practical use satellite, the examination satellite and the scientific satellite. I have recognition on the small satellite after 10 years since OSUMI launched. I got a chance to visit in United State in 1989, and when I had visited in Herndon city, Virginia of the suburban district of Washington DC, I was introduced Dr.Rick Fleeter, President of AeroAstro Inc. He founded the small satellite business company in the place of which converted the basement in his house by following the hobby in 1988. The encounter with Dr.Rick Fleeter is leaving me a deeply impression to small satellite. I strongly shocked by being making a satellite with the way as not thought of in Japan. At that time, my understanding of the satellite development was based on NASA Standard, and the development scheme was learned by the OJT from US. Then, I thought that there were required a big satellite test facility, clean rooms, test equipments, space qualified parts and materials etc, and also it was required immeasurable costs. Then, I could not believe to develop the satellite by those small venture companies. When I visited AeroAstro Inc. in 1989, it closed a basement at his house already and it was making a satellite in the rental office work place. The Alexis satellite (the 115 Kg weight, and launched in April, 1993) to be assembling was installed in the office work desk, and it was doing to incorporate a



ALEXIS Satellite (Courtesy of AeroAstro)

harness, data recorder adjustment, TT&C equipment examination, and solar cell sticking. in the introduced office. At that time, they did not have the S-Band TT&C antenna, and then we submitted our antenna to ALEXIS satellite. AeroAstro did not have a clean room. Also, the parts, materials, the transponder equipments that are installed into the satellite, were used the ground level equipments and parts.

This satellite was the earth observation satellite to be manufacturing in the request from the Los Alamos National Laboratory. If saying Los Alamos national Laboratory, in Japan, there is not a too good impression in the atomic bomb development. I came in the feeling in the body, knowing that such a famous laboratory ordered a satellite for small venture company and so, there was a policy to two pieces of satellite development in the United State. In the United States, it is developing a small satellite by small venture companies and also, as curriculum in several universities As of 1988, there were several venture companies of developing small satellite like AeroAstro, Orbital and CTA etc. They manufactured small satellites, which had been ordered by national science laboratories, and military laboratories. The development policy in these companies was all most same ideas of developing a cheapness satellite by using ground level parts, materials and simple test sets. The university recruits a theme from the students as the consistency of curriculum in UC Barkley, Minnesota, Toronto, Stanford, Colorado, Arizona and so on, and it was developed a satellite by students according to the adopted theme and launches it. Therefore, there are many cases, which fails even if it is launched. But, there is much vital energy to improve one after another even if it fails. Also, the USA supports it. I strongly impressed the US policy that a failure be a stepping-stone to success. If there will be failure in Japan, it make a thorough investigation, and many year of the satellite launches stop for a long time until the clear of cause

I don't doubt it, if saying the difference of eternal fitness of things, and a matter of difference in national character, but I think that is evidence with such a free idea, with a very broad base, which is being dominated over in leader in the world with the space development.

Small satellite is not only scientific observation, but also it is used actually military satellite as the mail delivery services by the store and forward system of CTA manufactured in the Gulf War. Also, in the business matter, Orbcomm of Orbital piled the small satellite of the

structure, which made a circular cylinder ring bounds in the unique satellite and was launched. It arranges 48 in LEO, and it is used for the satellite mobile communication by store & forward, and also the data communication in the world. In Japan, the transportation company is doing the use for the delivery management. Because a small satellite in the United States is supported by the taste, and I think it is possible to use the free idea for a satellite. There is a lot of technique that can be used for the large-sized practical use satellite in the technology that was gotten in the small satellite. It is the reason why I had an interest in the small satellite. At present, the AeroAstro develops to 2 Kg nanosatellite bus "Bitsy" and is selling in the world as the commercial satellite.

The communication satellite advanced towards the direction of the large-scale, but on the other hand, it pursues more miniaturization and the small satellite venture companies in the United States take charge of the leadership. As the proverb saying that we tend to be good at those things we like, If not liking, the good one cannot be developed. I introduced a small satellite because it is the good teaching material.

Thank you