PARDUS-SAT

aselsan

Organization: ATILIM UNIVERSITY and ASELSAN COMPANY
Assoc. Prof. Doc. Sedat NAZLIBİLEK

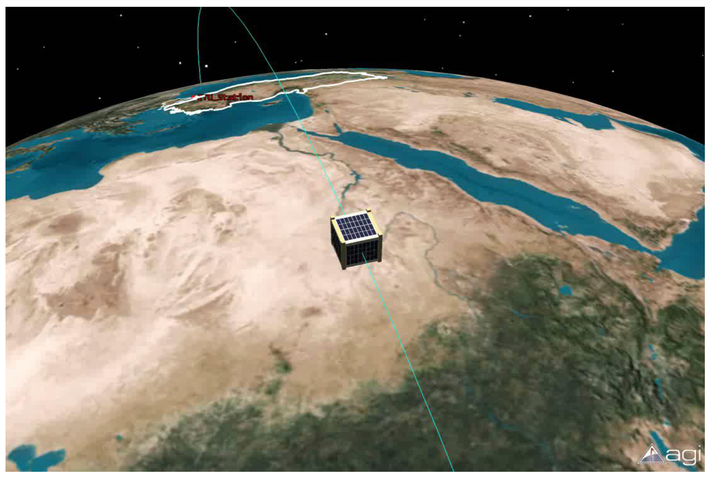
ATILIM UNIVERSITY 1996

Team

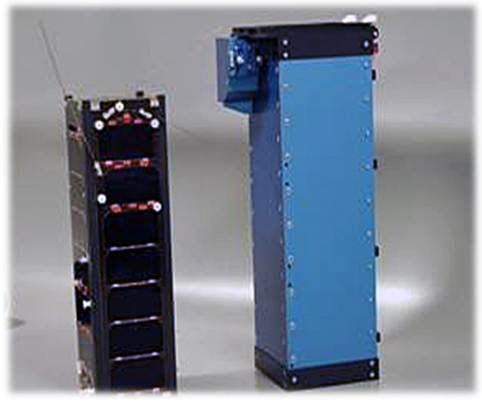
Dr. Alime ÖZYILDIRIM, ayanartas@aselsan.com.tr
Ufuk BOLATBAŞ, bolatbas.ufuk@gmail.com
Uğur TAŞCI, utasci@windowslive.com
Ulus Töre ÖZER, ulustoreozer@gmail.com
Deniz KARAÇOR, deniz.karacor@eng.ankara.edu.tr

Introduction

In different part of the world many of animals are threatened with extinction. In this study, Anatolian Leopard called PARDUS is of particular interest. This animal lives in south-western part of TURKEY. PARDUS, special animal, has been in danger over than 100 years because of illegal hunting. There are very rare animals still living in these regions. Our aim is to help the preservation of Anatolian Leopard from extinction. In order to achieve this goal, we need to observe the specific region where PARDUS lives. Since the region is mountainous and difficult to reach observation from space is of great importance to detect and recognize the animals and determine their way of living and number of them.

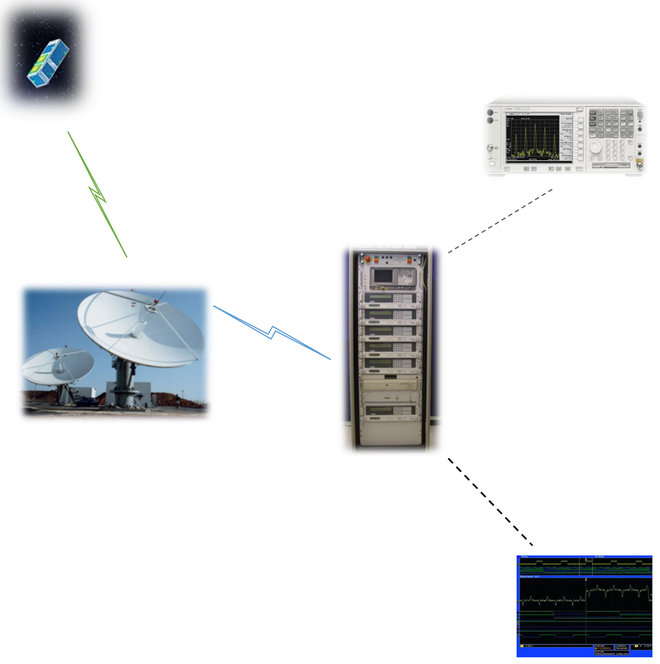


- Sub-systems
  - Satellite Computer
  - Structure and Mechanisms
  - Communication
  - Power
  - Attitude Control
  - Heat Control



Aim

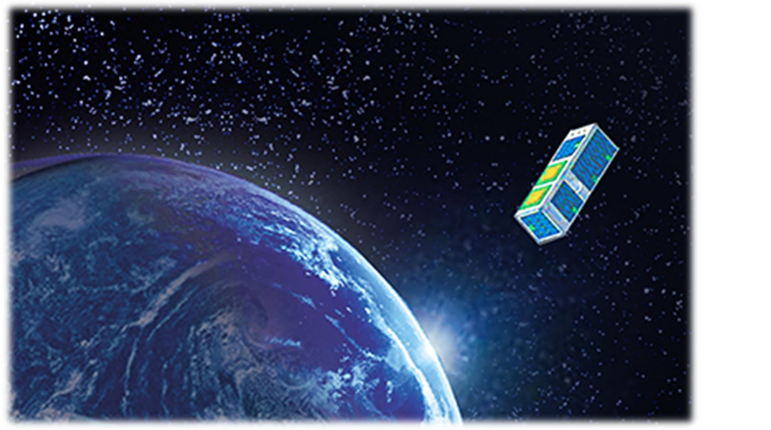
This project aims to track PARDUS (Anatolian Leopard) existence and their movements in specific time periods. Fully prepared nano-sat can observe selected areas and send instant information to the ground control base. By the help of this technology we hope that there will be no more illegal hunting on PARDUS.



Mission Objectives

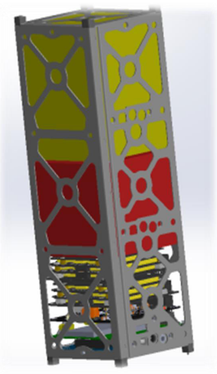
PARDUS-SAT is a special purpose nano-sat system that aims to provide aerial observation to protect Anatolian leopard (PARDUS) from illegal hunting. Main objective is to observe the selected area to get information about PARDUS and determine their behavior during specific time periods.
Objectives list;
1- Scanning and finding PARDUS in their natural habitat;
2- Collecting information by using camera module in colored images and sending them to the ground control base station;
3- Observe PARDUS movements and create a map of their habitat borders;
4- Observe PARDUS breeding and natural contender relations;
5- Prevent illegal hunting and early warning system in dangerous situations.

SUB-SYSTEMS	COMPONENTS	Mass (gr.)
Structure and Mechanisms	Main Structure	500
	Mechanisms	50
Sub-System Mass(gr.)		**550**
Power	Solar Panels	800
	EGS	80
	Battery	420
Sub-System Mass(gr.)		**1300**
Communication	Modem	100
	Pointer	50
	Antennas	50
Sub-System Mass(gr.)		**200**
Heat Control	Casing	100
Sub-System Mass(gr.)		**100**
Payload	Aselsan Camera and Transponder	1150
Sub-System Mass(gr.)		**1150**
Data Collection and Management	Computer	100
Sub-System Mass(gr.)		**100**
Attitude Control	Controller	80
	Sensors	20
	Actuators	300
Sub-System Mass(gr.)		**400**
Margin		200
TOTAL MASS(gr.)		**4000**

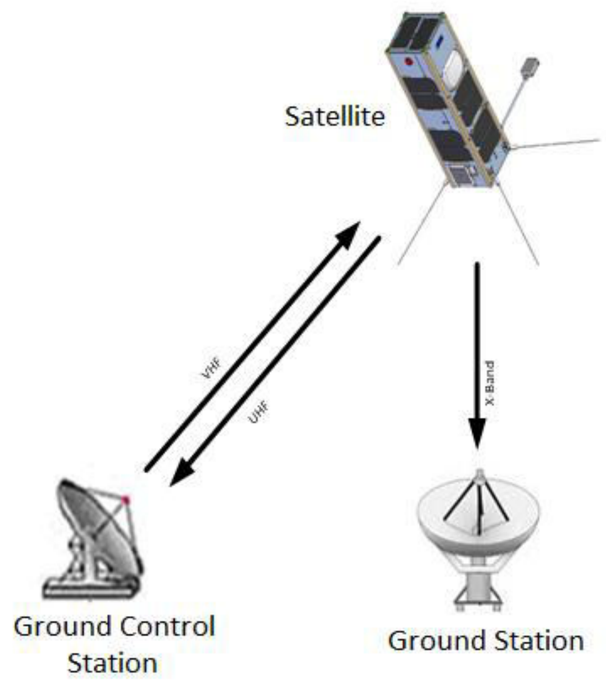


Orbit/Constellation Description

The PARDUS-SAT will have a circular LEO orbit. The re-visit time is 1 week. In the first application, only one satellite will be launched into the orbit. If one satellite is not enough to satisfy the objectives, we also have a plan to increase the number of satellites in the same orbit. The re-visit time will then be increased.



- Optical camera
- X Band downlink
- Pay Load(PL) power consumption< 25 W
- 3 axis sensitive attitude control
- PL mass < 1 kg
- PL volume < 1 U (10x10x10 cm)



Conceptual Design	July 2014- Sept. 2014
Engineering Model Construction and test	Sept. 2014- Jan. 2015
Flight Model	Jan. 2015 – May 2015
Launch Prototype	May 2015- July 2015
Constellation Construction	July- 2015- Sept. 2015
Constellation launch	2016
Ground control base design	2016
Ground control base Construction	2016