

**Extended Abstract by UNISEC-TR (ITU Space Lab) Student Representative
for the Student Session (2nd UNISON-Global meeting)**

Turkey

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Since the establishment of the “Space system design and test laboratory”, projects are being carried out. As a laboratory aim is not only finishing projects but to create a dynamic team and spread this knowledge throughout projects. With every project each person in the laboratory increases his/her capabilities in order to reach the project needs and get the job done. In each project requirements and challenges are different so as a result building a space system is not only for a one discipline but for multiple disciplines. Every project gives an opportunity to turn the knowledge in to experience. Throughout the projects students from different departments such as; Astronautical engineering, electrical/electronic engineering, mechanical engineering, physics. This kind of work improves teamwork and ability to search for true and useful information. Not only applying the knowledge by building something but also applying and using our knowledge by doing TVAC and vibration test. These tests have been being done since 2009. Creating test procedures, preparing the object to test, data handling and test methods are gained as experience directly.

We have also international students working with us for their summer training. Just like space itself projects about space are large enough to include more countries in it, for instance people from different countries are working or doing their internships in the space systems design and test laboratory so that both sides are learning while carrying the applied space studies to higher. It gives opportunity know different cultures and look to problems with different perspective. We have an intern from Tunisia who studies in France for his master’s degree.

As a part of UTEB (UNISEC-TR) activity, a CanSat Leader Training workshop was held, in order to attract more students and people in to space projects, between 16-27 June, 2014. As graduate students who are experienced in building satellites and its subsystems, we were helping lecturers and working with participants in the lessons to show them it is not too complicated and complex to build a satellite. For this CanSat workshop we ourselves learned how to build and launch a rocket which is also used to launch CanSats to nearly 500 meters. Even we were the people who helped participants in the lessons, we also learned new applications and research areas. In CanSat workshop; sensors, data handling, microcontrollers, parachute design, mechanical design, electrical design and cabling, wireless communication subjects are explained and applied.

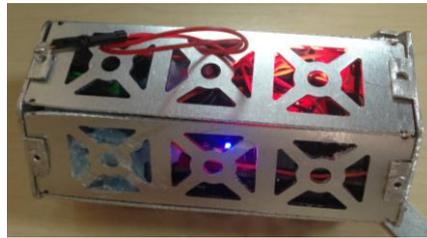


Figure 2: A CanSat built by participants



Figure 1: Participants are soldering some parts for their CanSat



Figure 3: Assembly of the rocket



Figure 4: Final preparations before launch



Figure 5: Memory photograph before launch

Mainly there are 4 ongoing projects. Main focus is to build two satellites for QB50 project. One is being built with Turkish air force academy called BeEagleSat, and the other one is being built with Havelsan which is a big Turkish company, called HavletSat. For both of the satellites there is a science unit called M-NLP which needs to collect data from lower atmosphere and send them to ground station. Their mechanical design and subsystems are being designed in the laboratory and also space qualification tests will be made here.

Second; we have launched the 3USAT on 26th April 2013. The first successful communication made by radio amateurs the day after launch. Currently, we are working on converting the engineering model in to a second flight model.

Third; we have been working for a X-Ray detector for CubeSat which will be used and tested in the BeEagleSat. Detector subsystems itself is being designed and manufactured by students and their test will be made by students.

Last; we have been also working on an subsystem which has ability to be used as an OBC and Modem at the same time in order to save space in the CubeSat. Also this subsystem will be used in both of the satellites BeEaglesat and Havelsat.

As a next step, we intend to develop a new electrical power system and its battery pack, as an important step to have a complete CubeSat bus. Result of this work will make it easy to test new equipment and science units in space directly.