

First among Private Universities: Department of Aerospace Engineering Successfully Launches Independently Developed Rocket

The "TKU-I" sounding rocket, developed by the Department of Aerospace Engineering, was successfully test-fired for the first time at 6:27 am on the morning of June 5th in Xuhai, Pingtung County. It is the 3rd university team in the country to achieve this, following National Yang Ming Chiao Tung University and National Cheng Kung University. As a result, our university has become the first private university to use the short-term scientific research sounding rocket launch site for rocket testing.

The Principal Investigator, Professor Yi-Ren Wang of the Department of Aerospace Engineering, stated that due to the team's lack of experience in launching large rockets, this test launch had 2 main objectives. The first was to test the team's ability to integrate rocket systems, and the second was to test the communication and telemetry systems in preparation for future full-scale rockets. Guang-Cheng Bao, a master student responsible for rocket engine development, explained that RNK is an emerging solid propellant known for its stability and safety. Therefore, this test launch also aimed to verify the capability of this propellant to propel the rocket to several kilometers in altitude.

Professor Fu-Yuen Hsiao, chair of the Department of Aerospace Engineering, expressed that the acquisition of telemetry data and the entire process of rocket ascent went smoothly, validating the design and engineering capabilities of our university's research team. He stated, "According to the reports from the tracking station, the rocket's flight altitude measured 4,827 meters, which is quite accurate compared to the simulated altitude of 4,600 meters." He expressed special thanks to the support from the National Science and Technology Council and Taiwan Space Agency. He also mentioned that the Department of Aerospace Engineering has been offering space engineering-related courses for many years and has established a Space Technology Laboratory to provide students with training in space system engineering through the development of small-

scale KNSB propellant rockets. He believes, "This opportunity to launch kilometer-class rockets can validate the educational achievements of these years, and these students can become the backbone of our country's space industry in the future."

The "TKU-1" is a single-stage solid rocket with an average thrust of 150 kilograms. It was developed by the student team led by Prof. Wang from the Department of Aerospace Engineering. The rocket has a total length of 1.82 meters, a maximum diameter of 12 centimeters, and weighs approximately 34 kilograms. The rocket uses the emerging RNX propellant (a type of nitrate composite propellant) with an average thrust of 150 kilograms and a maximum thrust of 200 kilograms. It has a burn time of 9 seconds and a total impulse of approximately 13,500 Newton-seconds, reaching a flight altitude of 5 kilometers. The test launch was originally scheduled for the 29th of last month but was postponed by a week due to the impact of Typhoon Mawar.

Due to the high cost of the sounding rocket launch project, Dr. Hsiao also expressed special thanks to the College of Engineering, Dragonfly Unmanned Aircraft Systems Co., Ltd., and WK Automated Intelligence Co., Ltd. for their long-term support of various activities in the department. He also mentioned that Mr. Rong-Bin Wu, alumnus of our university and Chairman of QST International Corp., made a generous donation to support rocket development, making this test launch project possible and successful.

2023/06/26





