TWIGGS
S P A C E L A B

INSPIRING SPACE INNOVATION

QB2 PocketQube System
## Learn to Build, Test and Operate a Picosatellite

Cubito ("QB2") is Spanish for "little cube." The QB2 PocketQube System is based on a concept and standard first proposed by Professor Bob Twiggs, to develop a satellite (5 cm x 5 cm x 5 cm) that could fit in a pocket. The QB2 PocketQube Engineering Model ("QB2EM") is the perfect engineering system to provide students with challenging experiential learning opportunities, including: evaluating and operating satellite subsystems; assessing subsystem interactions; investigating FlatSat development and testing procedures; constructing and operating a pico-satellite engineering model; operating a ground station and communicating with QB2EM; demonstrating, communicating and modifying satellite operations; performing remote sensor measurements; programing firmware and concept of operations; developing new payloads by adding sensors or instruments, or by modifying software commands; and many more activities.

Command and Data Handling Subsystem (CDH)

Communications Subsystem (COM)

Electrical Power Subsystem (EPS) with BAT Module

Proto Board (PRT)
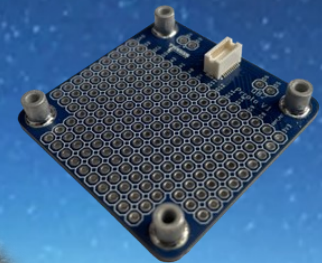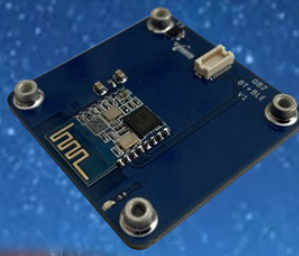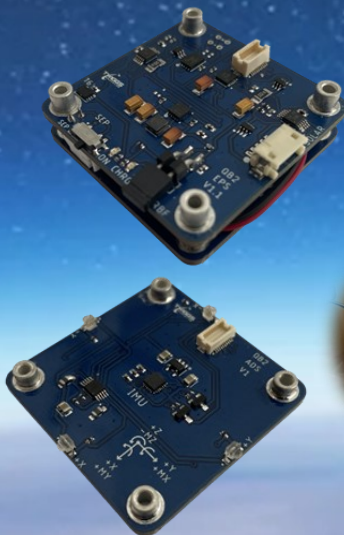
Attitude Determination Subsystem (ADS)

Student Quality Manager —Testing the QB2EM

Arduino Uno Adapter

The QB2 PocketQube System includes: an Arduino Uno Adapter; FlatSat Adapter; five subsystems (CDH, EPS and BAT Module, ADS, COM, and PRT); detailed User Manuals for subsystem testing and operations, QB2EM integration, and Interface Control Documents; software libraries; and a Pelican case for safe storage and transport. A Project Manager can assign team members for each subsystem to test subsystem functionality and then integrate into the QB2EM. Once the QB2EM is fully integrated, the Ground Station software (computer and smart phone) can be used to receive QB2 telemetry and transmit commands to the QB2EM.

"The QB2EM is a great tool for students to learn about satellite subsystems and systems engineering by constructing, testing, operating, and receiving satellite mission data. The QB2EM functions like a real satellite and students can view QB2 data on a computer terminal or smart phone. Students love to send commands to the QB2 from their smart phones!"

Professor Garcia
Morehead State University

"The QB2 PocketQube System is an affordable, fully functional engineering model based on the PocketQube standard and provides science and engineering students a cost-effective means for developing real world skills. I wish my classes had access to QB2 when I was teaching Space Design and Systems Engineering courses at Stanford and MSU."

Professor Bob Twiggs
Stanford University and Morehead State University (retired)

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