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AN INNOVATIVE MODULARIZED SMARTPHONE SATELLITE WITH FOLDABLE  
CONFIGURATION**Abstract**

This paper proposed a low-cost satellite developed by Northwestern Polytechnical University of China that makes use of most components of smartphone. This satellite with about 0.5kg weight was scheduled to undertake missions of observing the surface morphology of the earth, and communicating with the ground and other satellites. An innovative foldable configuration with several boxes was created to compartmentalize equipment and devices of the satellite. Different from classical one box-type configuration, the proposed one can provide more efficient layout. To meet mission requirements, four functional modules of power, phone, control, communication were installed in four independent boxes. The phone module is composed of the high-resolution cameras, micro-sensors, high speed processor, GPS receiver from NOTE2, and provide function of observing the morphology. The power module is composed of external solar cells, internal Lithium-ion battery and power conversion devices, and will provide electricity power for all avionics of the satellite. The communication module is composed of UHF, WIFI and S-band communication devices, and provides communication function between satellite and ground station, and other satellites. The control module is composed of 48 micro propellers and 3 magnetic torques to provide attitude and orbital control capabilities. The electronics of all modules are deployed on a flexible printed circuit board (FPCB) that connects four modules mechanically and electrically. Compared with concepts of existing CubeSat and PhoneSat, the presented satellite in this research has a lot of advantages in power supplementary, electromagnetic interference restraining, and launch flexibility. The proposed satellite can be deployed individually or as a colony to execute space observing missions. Now, the prototype of satellite has been built and being tested on the ground. In this paper, the mission analysis, system design and simulation results, structural design and simulation results, system building and testing will be reported. Also, the next-step arrangement about launch will be reported.