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# REMOTE SENSING SATELLITE FORMOSAT-5

**Abstract**

As an extension of the widely-accepted FORMOSAT-2 remote sensing satellite, National SPace Organization (NSPO) in Taiwan is developing FORMOSAT-5 to continue its international earth observation image services. With 20-year successful experience on three satellite programs, NSPO has set its goal to become more self-reliant in space technology and FORMOSAT-5 program naturally has become an important development tool to meet the purpose. On board computer, power control supply unit, and flight software are some of the key technologies being developed under the program and a CMOS-type remote sensing instrument (RSI) is 100% being designed/made in Taiwan. NSPO is taking the advantages of domestic industrial strength in software, IC design and electronic manufacturing to develop these space-qualified components and RSI. Recent critical technical breakthroughs have moved FORMOSAT-5 program into its final stage of critical design phase. Images of 2-meter resolution in panchromatic (PAN) and 4-meter in multi-spectrum (MS) will be served by the satellite, which will be ready for launch by end of 2014 into a two-day revisit Sun-synchronous orbit with 720 km altitude and 98.28 deg inclination.

In this paper, FORMOSAT-5 program status including development strategy, up-to-date designs, key component breakthroughs, innovative mission operations, image processing advances, and performance of the CMOS sensor engineering chip will be reported. Under NARL (National Applied Research Laboratories) guidance, NSPO has successfully integrated domestic high technology industries and research institutes into a competent team to execute the program. FORMOSAT-5 is the first space program that NSPO takes full responsibility for the complete satellite system engineering design including payloads. Primary RSI payload consists of one 12000-pixel PAN band and four 6000-pixel MS bands. The National Central University science team is responsible for a secondary scientific payload, Advanced Ionospheric Probe (AIP), which will conduct a systematic examination of the global and seasonal variations in the topside F region plasma parameters. To meet FORMOSAT-5 specifications, RSI CMOS IC design/manufacturing technology, telescope CFRP strut manufacturing process, and on-board image data compression and de-compression techniques are among the important development breakthroughs for the program.