

HIGH CHANNEL-COUNT TESTING

Vibration and modal testing systems for Chinese spacecraft development demands maximum system stability and reliability

Qualification and acceptance testing on large and fragile aerospace structures such as spacecraft and satellites presents a unique challenge. Such items face the most extreme operating conditions and must meet the most stringent environmental demands. Testing plays a vital role in the development of the product and it is essential that tests on spacecraft, aircraft wings, satellites and other components are conducted safely and that all available data is captured and stored securely.

The China Academy of Space Technology (CAST) is China's main spacecraft development and production facility. Its space programs include the Dong Fang Hong satellites, the Shenzhou Divine Craft space vessel and the Chang'e lunar orbiters and exploration vehicles. CAST has multiple subsidiaries. One of them, the Research Institute (Institute of Assembly and Environmental Engineering) in Beijing, conducts a wide variety of dynamic and reliability tests and environmental

simulations. The Institute, which is one of the largest spacecraft environment test centers in the world, performs simulation and acceptance tests for spacecraft and satellites on large-scale test equipment. For example, the Chang'e 2 satellite was subject to a series of closely defined and strictly controlled tests to achieve the final sign-off before its launch.

CAST selected m+p international's m+p VibControl and m+p Analyzer software for data acquisition, post-processing and modal testing, using the m+p VibRunner hardware.

The system has 456 channels of analog input and eight channels of analog output. It has two racks that accommodate 20 m+p VibRunner modules and two servers that are used for throughput recording and data sample processing.

The system is used in aerospace dynamics environmental testing, including swept sine and random vibration test, noise test, shock response spectrum analysis, impact test and modal analysis.



- 1 // m+p international's dynamic testing instrumentation
- 2 // International space station
- 3 // Parallel time history recording and random vibration testing

Large specimens such as the Chang'e 2 satellite have hundreds of critical locations where vibration data must be monitored and recorded during a test. To make sure all the data is captured, a time domain throughput facility in m+p international's system was used in both sine and random data reduction modes. This enables time data to be stored in addition to frequency data. This is crucial for critical aerospace testing, where high numbers of channels are required for post-test and possible failure analysis. The time history data is recorded in parallel with vibration control without reduction in control performance. With m+p international's wide range of input ranges and filter functionality, all the test requirements can be fulfilled.

For high-end vibration and modal testing, the stability of the system and absolute confidence in the test data are crucial. Engineers at the Institute of Assembly and Environmental Engineering are delighted with the excellent stability and reliability of m+p international's advanced test equipment. As a result, CAST now has several m+p VibControl and m+p Analyzer systems with a total of over 1,000 input channels. \\\



READER INQUIRY 106

FREE READER INQUIRY SERVICE

M+P INTERNATIONAL

To learn more about this advertiser, visit www.ukipme.com/info/tea NOW!