

# **Xi'An Satellite Control Center and Orbit Dynamics Technology**

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China Xi'an Satellite Control Center (XSCC) is subordinate to China satellite Launch, Tracking and Control general (CLTC), and acts as the administrator of China space Tracking, telemetry and Command (TT&C) Network (CSTN)



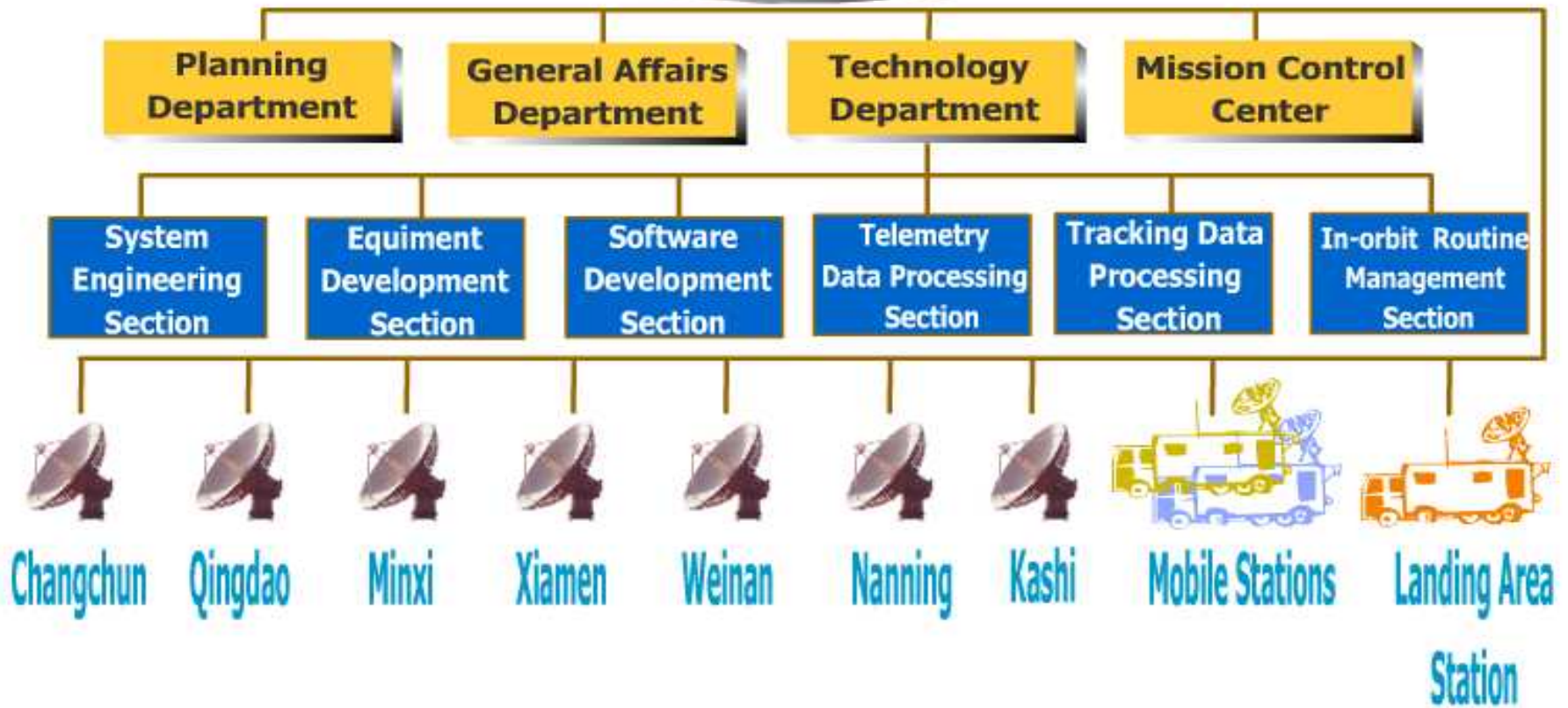
● Established in 1967, and located in historic city Xi'an, XSCC is the center for information exchange, command and control, data processing and communication of China's TT&C network. It is charged with the operation, tracking of spacecraft, and data processing, orbit calculation/control and recovery of re-entry modules



● XSCC has successfully provided TT&C support to all China satellite missions and 7 Shenzhou spaceship missions since China launched its first satellite into orbit in April 24, 1970.



# ORGANIZATION OF XSCC



# VHF TT&C Network



- It includes Nanning Station, Kashi Station, Changchun Station and Mobile Stations. It has the capability to carry out ranging, velocity measurement, telemetry and telecommand activities. It is used for low/medium orbit TT&C missions.

## C-band TT&C Network



- It includes Weinan Station, Xiamen Station and Instrumentation ships. It is equipped with C-band TT&C system, motion-limited station and telemetry reception station. It has ranging, angle measurement, telemetry and telecommand functions and is mainly used for GEO TT&C support.

# S-band TT&C Network



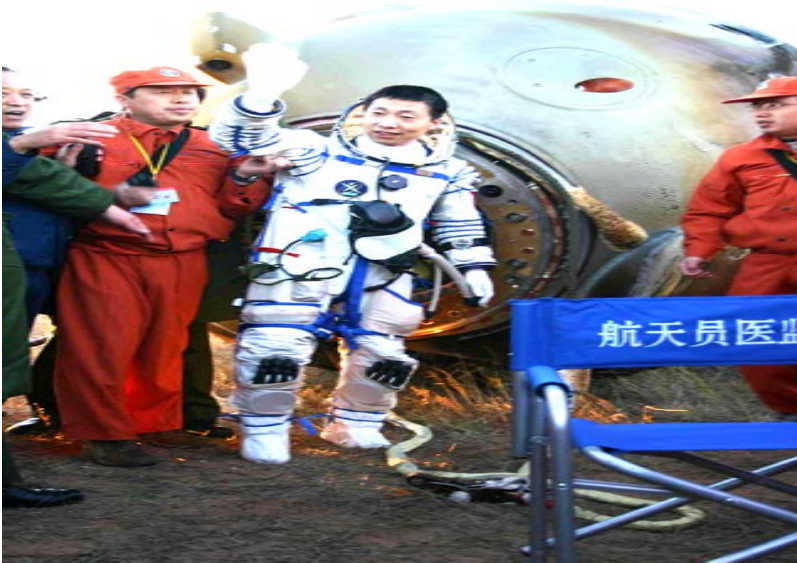
- It includes Weinan Station, Xiamen Station, Qingdao Station, Nanning Station, Kashi Station, mobile stations and instrumentation ships. USB is the main equipment. It has ranging, velocity/angle measurement, telemetry, telecommand, voice communication and TV transmission functions, and is mainly used for low/medium orbit and manned spacecraft TT&C support.



# Development of Orbit

Since the foundation of XSCC, research of orbit determination methods and improvement of orbit models is uninterrupted works here. Through years of practice, several methods of orbit determination have come into being, and have been testified and applied in real-time orbit monitoring, initial orbit determination and precision orbit determination of different spacecraft.

XSCC have achieved seven historic milestones, namely, launching into space, returning to earth, synchronous station-keeping, controlling multiple satellites within one TT&C network, compatibility with international standard, recovery of spaceships and circling the moon.



# State Key Laboratory of Astronautic Dynamics

The main research fields:

precise orbit determination

orbit and attitude control

spaceflight environment monitoring

With the development of POD software and technology in XSCC, precision of spacecraft position have developed from dimension of kilometer in the 1970s, to dimension of centimeter in radial for special satellites presently. Level of POD rises to a new step every ten years. Looking into future, XSCC will continue to improve its TT&C coverage, optimize TT&C precision, and promote cross-support and cooperation with foreign networks and agencies. On the floor of state key laboratory, we look forward to more exchanges and cooperation with our counterparts.