

TerraSAR-X & TanDEM-X

David Miller

**DLR - Raumfahrt-Industrietage in
Friedrichshafen
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All the space you need





Missions Overview

- Terra**SAR**-X & Tan**DEM**-X
 - Satellites with X-Band (9.65GHz) **S**ynthetic **A**perture **R**adar using an active antenna (electronic beam steering)
 - High resolution flexible imaging independent of time-of-day/weather
- TerraSAR-X launched in June 2007; Commissioning Phase to December 2007 then successful operation to date (collection of nominal SAR data)
- TanDEM-X launch in October 2009: rebuild with additional Cold Gas System and Inter-Satellite Link Receiver
- Formation flying of TerraSAR-X & TanDEM-X for 3 years to collect **D**igital **E**levation **M**odel data (shared with nominal operation)
- Nominal operation for remainder of TanDEM-X life



Project Structure

- Public-Private Partnership between DLR and Astrium GmbH – cooperation to meet scientific and commercial goals
 - DLR provides the Ground Segment, owns the data and coordinates the scientific utilisation
 - Astrium is the prime contractor for the Space Segment (including radar) and finances part of its cost
 - Infoterra serves the commercial customers and provides a sales-dependent share of the operating costs
 - GFZ Potsdam provides the Tracking, Occultation & Ranging Equipment
- Major Subcontract: EADS DE for the radar Central Electronics and Transmit-Receive Modules



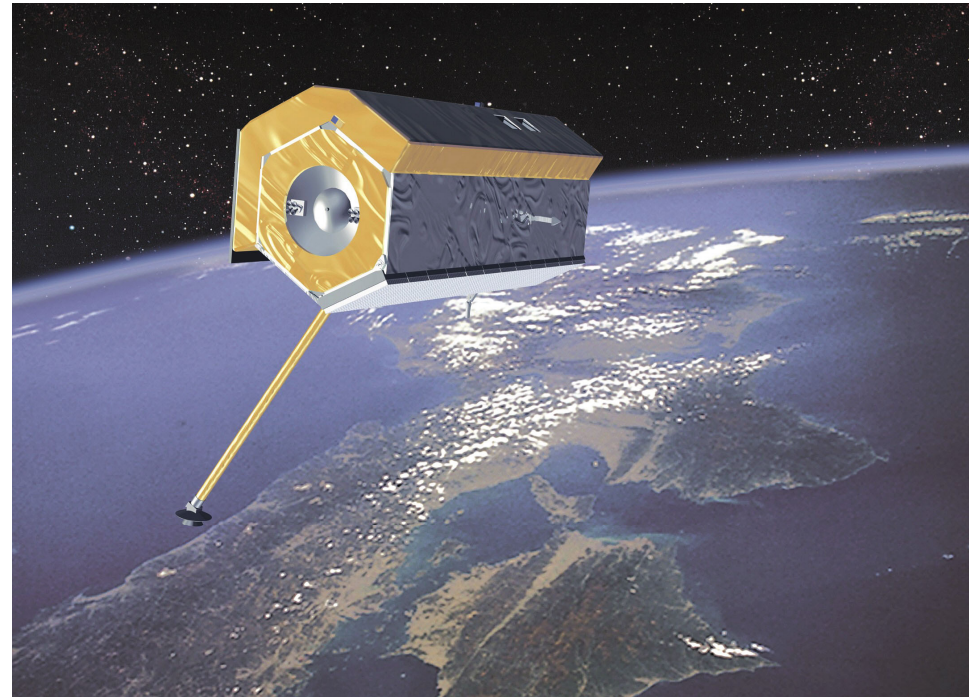
Main Orbit/Satellite Characteristics

Orbit

- Sun-synchronous
- 514km altitude/97.4° inclination
- 18:00 ascending pass
- 11 days repeat cycle

Satellite

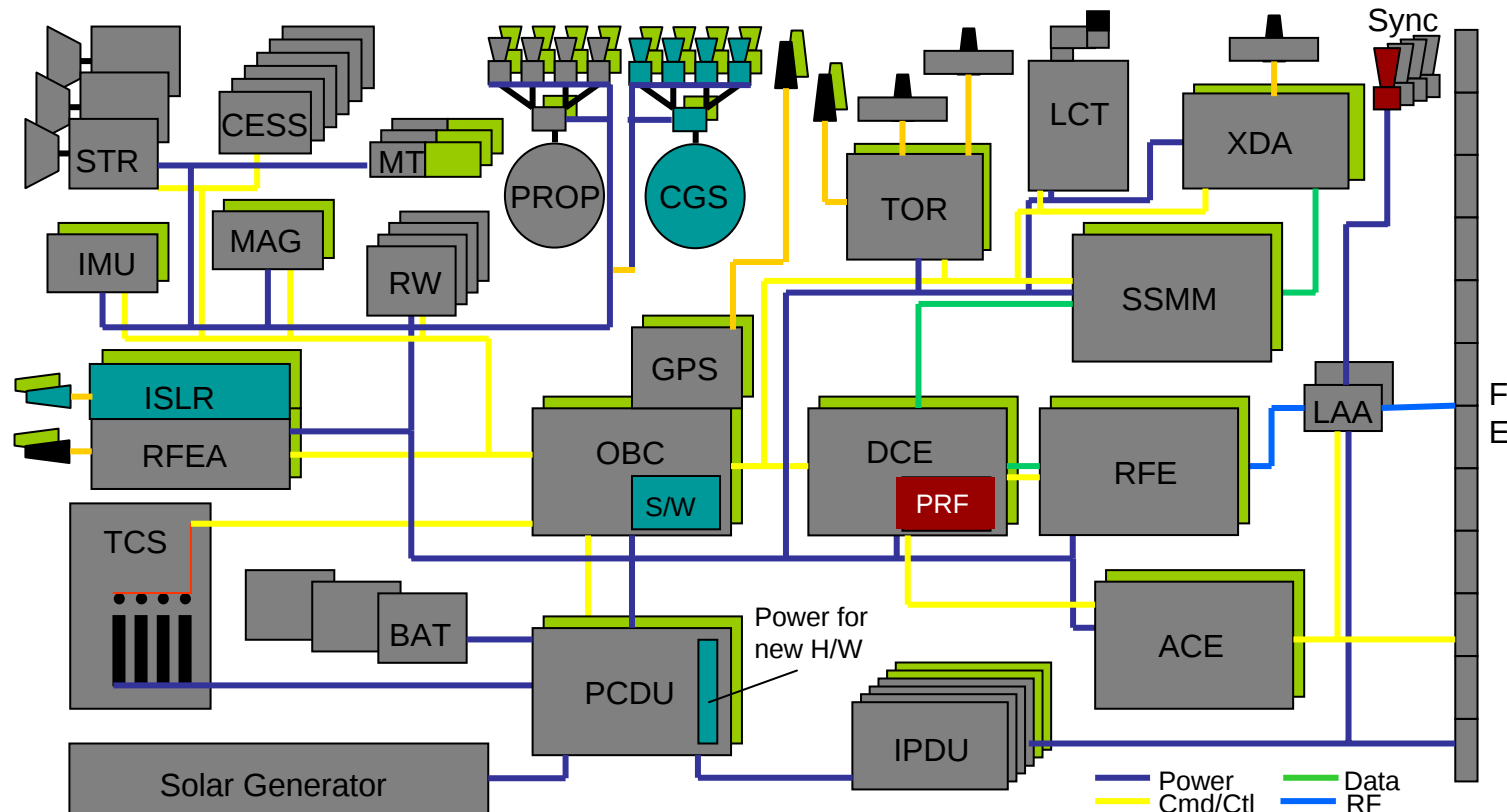
- About 5m length
- 1350kg mass
- Fixed Solar Array
- Deployable boom for X-band downlink antenna
- Left looking for short periods



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Satellite Blockdiagram



■ Only on TanDEM-X

■ Already implemented on TerraSAR-X

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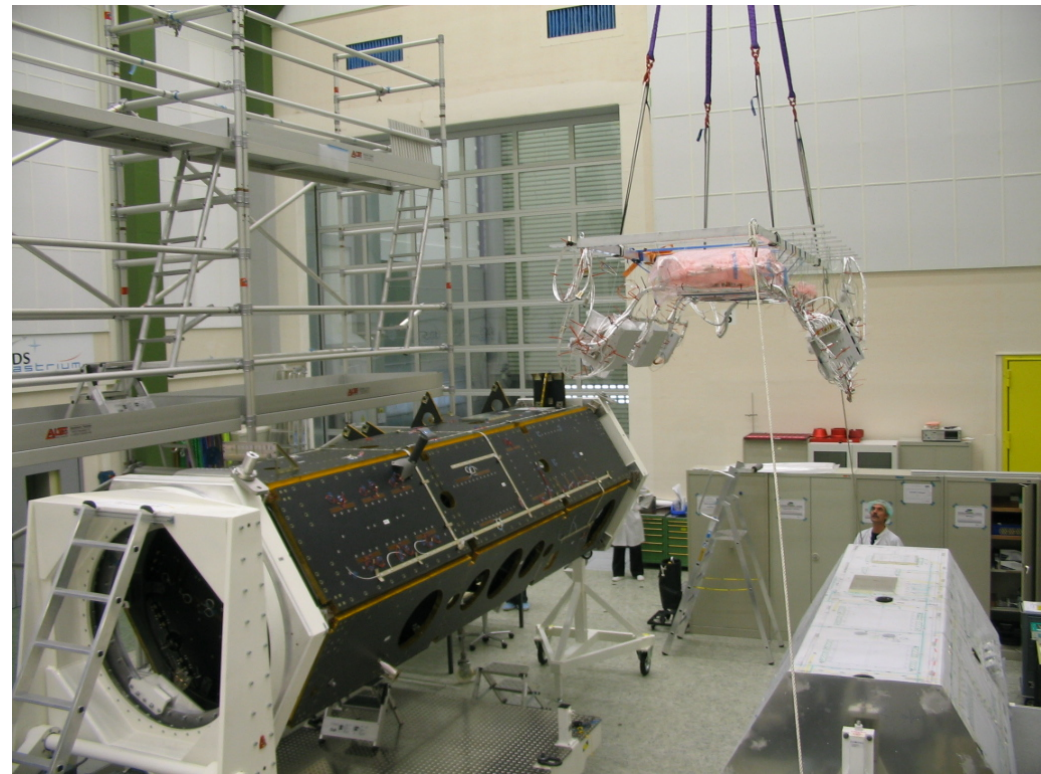
TerraSAR-X & TanDEM-X KMUs

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Topic	TerraSAR-X		TanDEM-X	Activities
Harness	Eurospace, Sommer		as TSX	Flight unit responsible
Magnet Torquer	ZARM		as TSX	Flight unit responsible
Star Tracker	DJO		as TSX	Flight unit responsible
Reaction Wheels	Teldix		as TSX	Flight unit responsible
MGSE	LICO		(reused)	
Env Test Facilities	IABG		as TSX	
Antenna Subarrays - CFRP Waveguides	Invent		as TSX	Important Flight Technology/Processes
Antenna Subarrays - Milling	Schorpp		as TSX	Important Flight Technology/Processes
Antenna Subarrays - Feed Probe Soldering	Haberer Spacetec		as TSX	Important Flight Technology/Processes
Antenna Subarrays - Glueing	Xperion		as TSX	Important Flight Technology/Processes
Antenna Subarrays - Feed Probes	Hubert & Suhner		as TSX	Important Flight Technology/Processes
Secondary Structure	Freyer		as TSX	
Radio Frequency Electronics Assembly	(Warberry UK)		Taubenreuther	Flight unit responsible
Inter Satellite Link Receiver	n/a		Taubenreuther	Flight unit responsible
Satellite Structure	Xperion		as TSX	Important Flight Technology/Processes
CGS Unit Tester	n/a		Heske	
X-Band Down Link Assembly	Tesat		as TSX	Flight unit responsible
SSMM Modules & EGSE	IDA		(reused)	Important Flight Technology/Processes
Telemeter	NF Scanner		(reused)	



First integration steps (October 2007)



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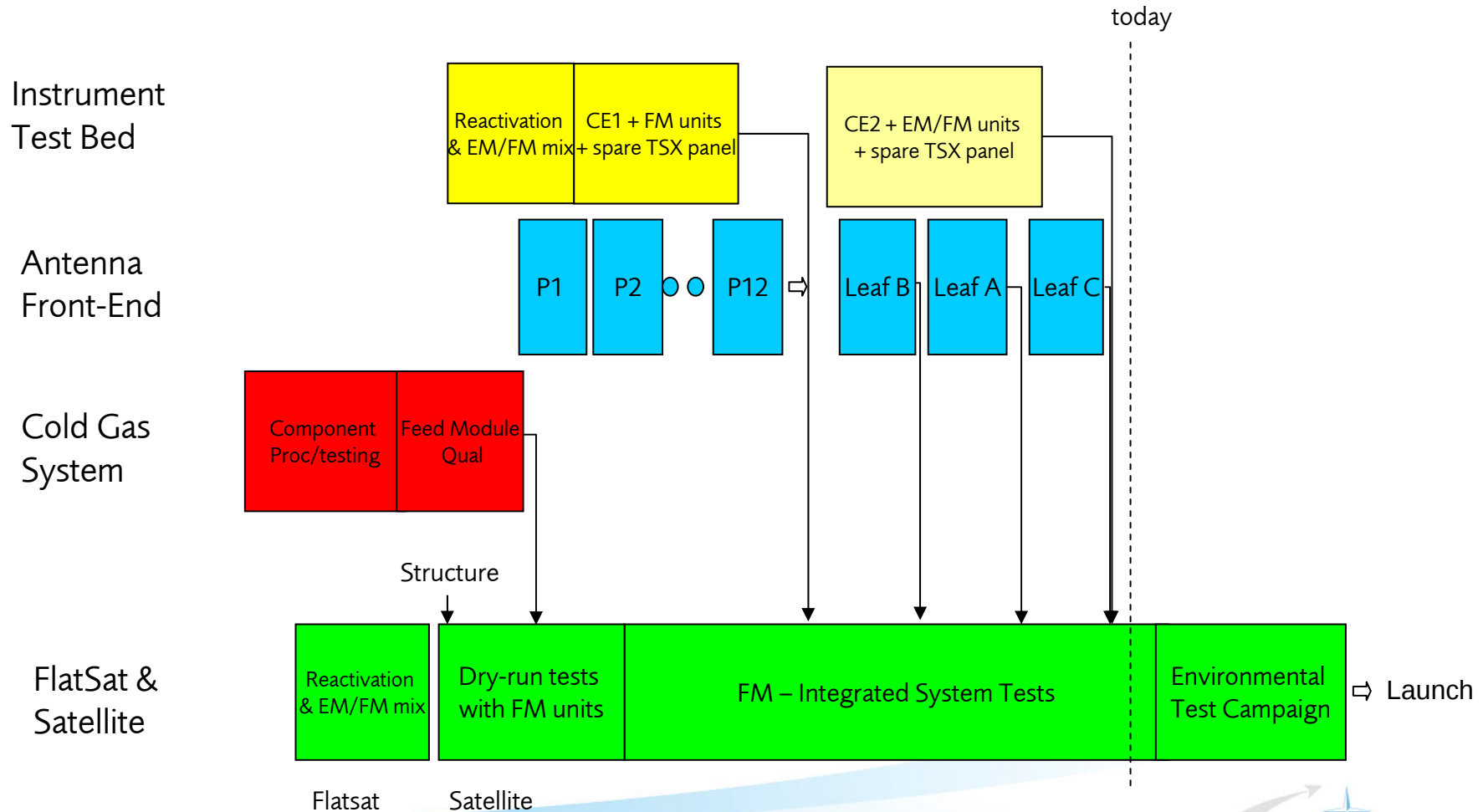
RFIT





Integration Overview & Status

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