SAR

Synthetic Aperture Radar

Synthetic aperture radar provides fine-resolution images of terrain and ground-based natural and cultural targets, day or night, in adverse weather. Sandia's SAR systems can produce detailed images at resolutions of 4" in range and azimuth dimensions. Maps and images covering large geographic areas can be produced on-board the aircraft in real-time. Applications include military and intelligence systems, earth resource mapping, and environmental monitoring.

Sandia's SAR work emphasizes the following technical areas:

- Imaging-radar research and development
- Intelligence, surveillance and reconnaissance applications
- Precision guidance and targeting
- Radar data collections

Experience:

Sandia's radar experience has its roots in weapon radar fuzes developed for the Department of Energy beginning in the 1950s. Sandia's SAR work began in the early 1980s. Since that time, we have developed state-of-the-art SAR systems for numerous customers and flight platforms in UHF, L, S, X, Ku, and Ka frequency bands. Sandia-developed SARs are typically flight-tested aboard our Twin Otter Testbed aircraft and later integrated into the customer's host aircraft. Sandia designed SAR systems have been used for real-time surveillance by every United States Military command.

www.sandia.gov/radar/sar.html

Sandia National Laboratories

Development Capability:

Sandia designs and develops all major component assemblies of each SAR system. We have significant design capabilities in antennas, gimbals, RF front ends, embedded processing, miniaturization, transmitters, microwave modules, high-speed digital circuitry, digital waveform synthesis, digital receivers, motion measurement, motion compensation, and multi-node flight computer software. We integrate, laboratory-test, and flight-test each system to assure that it meets performance requirements.
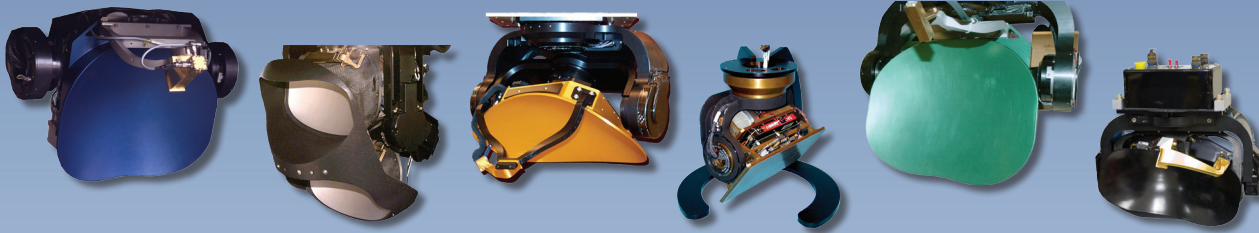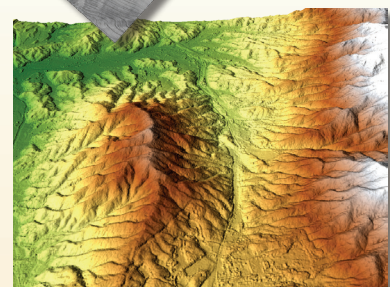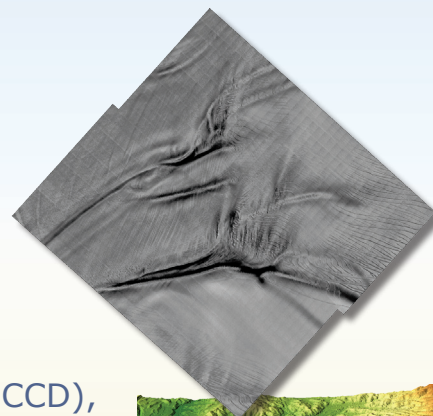

Innovation in *SAR*

Sandia continues to lead the state-of-the-art in a number of radar technologies
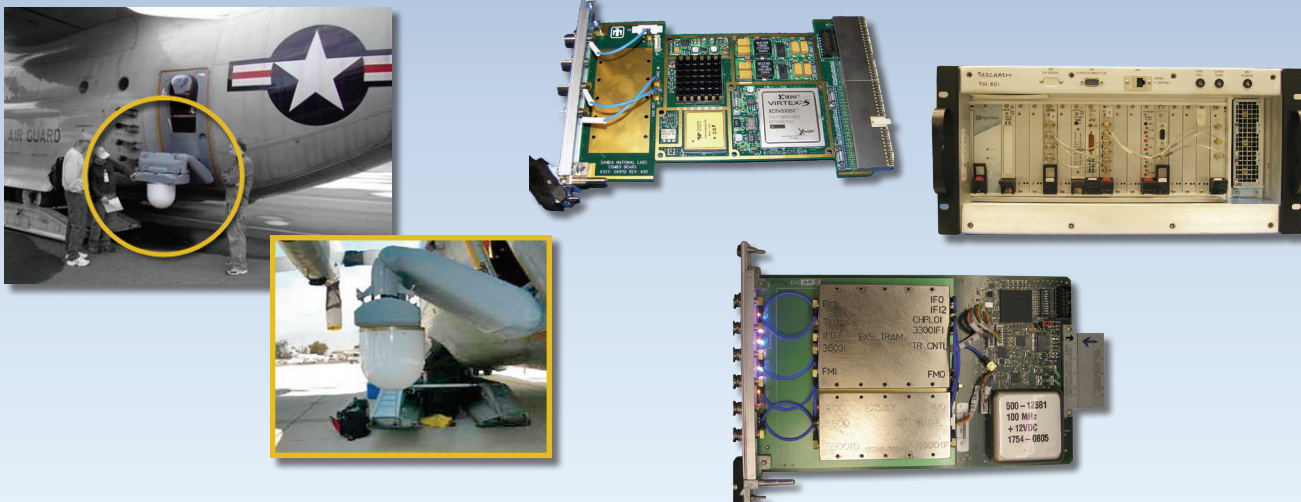
- Miniaturization
- Bistatics
- Real-time:
  - Fine-resolution SAR image processing and exploitation
  - High-accuracy interferometric SAR (IFSAR) and terrain mapping
  - Algorithims for image formation, autofocus, coherent change detection (CCD), ATR and GMTI/vibrometry

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