



ZIN Technologies

## ISS Space Communications and Navigation (SCaN) Testbed



### OVERVIEW

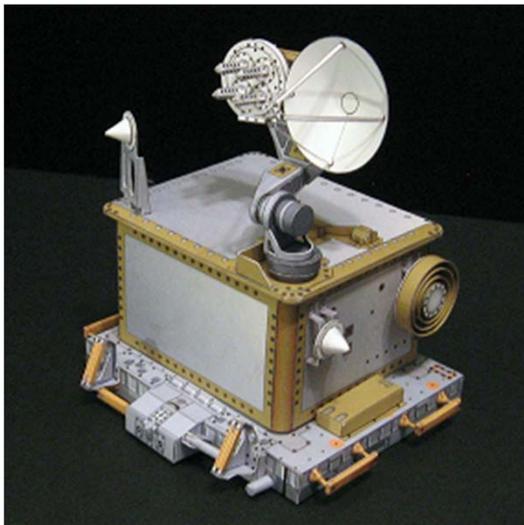
The Space Communications and Navigation (SCaN) Testbed provides a platform for Software Defined Radios (SDRs) to experiment with software and firmware configurations, while communicating via Radio Frequency (RF) links with the TDRSS and GPS satellite constellations and the Near Earth Network.

The goals of this testbed are to validate future mission concepts and operational capabilities for NASA's Communication, Networking and Navigation needs; advance SDRs to Technology Readiness Level-7; and advance the Space Telecommunications Radio System (STRS) Standard for SDRs.

### APPLICATIONS

The growth SDRs offers NASA the opportunity to improve the way space missions develop and operate space transceivers for communications, networking, and navigation. Reconfigurable SDRs with communications and navigation functions implemented in software provide the capability to change the functionality of the radio during a mission and optimize the data capabilities (e.g. video, telemetry, voice, etc.).

# ISS Space Communications and Navigation (SCaN) Testbed



Astronauts, mission controllers, and scientists depend upon the reliable transmission of information between Earth and spacecraft, from low-Earth orbit to deep space. The SCaN Testbed is an advanced integrated communications system and laboratory facility installed on the ISS. Using a new generation of Software Defined Radio (SDR) technologies, this ISS facility allows researchers to develop, test, and demonstrate new communications, networking, and navigation capabilities in the actual environment of space. The SCaN Testbed advances space communication technologies in support of future NASA missions and other U.S. space endeavors.

During its development at NASA Glenn Research Center, the SCaN Testbed was also known as the Communications, Navigation, and Networking reConfigurable Testbed (CoNNeCT) project.

- ❑ The SCaN Testbed is located on the International Space Station (ISS) port (P3) ExPRESS Logistics Carrier (ELC), mounted on the starboard side of the P3 ELC on the zenith/ram corner.
- ❑ The SCaN Testbed consists of an Avionics unit for payload command and control, three Software Defined Radios (SDRs), an RF Subsystem, a Traveling Wave Tube Amplifier (TWTA), an Antenna Pointing System (APS), and five antennas.
- ❑ SCaN Testbed payload mission operations are performed at the Glenn Research Center (GRC)
- ❑ Space-Rated design meets common transport requirements for EMC, Shock, Vibration, Thermal Vacuum, Outgassing, and EEE-INST-002 parts control requirements.



*Located ISS port (P3) ExPRESS Logistics Carrier*



**ZIN Technologies Inc.**

6745 Engle Road | Middleburg Heights, Oh 44130  
Phone: 440.625-2223 | johansonm@zin-tech.com | www.ZIN-Tech.com



## ISS National Lab CASIS Implementation Partner

For 25 years, the ZIN engineering team has partnered with NASA management, scientific experts and industry to manage and develop space flight systems, from concept definition, design, development, and fabrication to system assembly, integration, test, launch, operations and return.

As an implementation Partner for the ISS National Laboratory ZIN can streamline ISS science facility utilization to researchers, businesses and educators to take advantage of the unique benefits offered through space-based investigations providing a variety of services to enable efficient execution of science initiatives.



Focus on Quality - Certified and Compliant with Industry and Government Quality Standards



Over 200 Payloads delivered, integrated and operated for shuttle, MIR, and ISS – 75% of all physical science research on ISS since 2001

## OUR PRODUCTS & SERVICES

### PRE FLIGHT:

ZIN provides a wide range of products and services and demonstrated experience for space-based science investigations.

- ❑ Access to a large repository of previous space experiments that align with promising commercial applications
- ❑ Collaboration with experienced payload developers and other subject matter experts to ensure successful experiment operations
- ❑ Utilization of unique capabilities and facilities for developing payloads
- ❑ Coordination with NASA and launch vehicle providers for transparent and easy interaction with investigators

### IN - FLIGHT:

ZIN can support private sector product development and ensure seamless investigation implementation, including:

- ❑ Support of “real time” on orbit payload operations -Telescience Support Center
- ❑ Interfacing with ISS crew during experiment interaction
- ❑ Facilitation of data and software interfaces
- ❑ Coordination of contingency planning for mission changes to preserve science objectives

### Primary Services:

- ❑ Hardware design, manufacture and certification
- ❑ Hardware analytical and physical integration
- ❑ Full lifecycle software, integration & testing
- ❑ Program management
- ❑ Export Compliance
- ❑ Hands-on crew training
- ❑ On-orbit operations

### POST- FLIGHT:

After the project comes back to Earth, ZIN can assist with the following:

- ❑ All post-flight data & report requirements are submitted to the principal investigator in a timely fashion
- ❑ Post Flight Testing and Data Analysis
- ❑ Logistics support for sample and hardware return from ISS
- ❑ Identification and support at appropriate facilities for post-processing activities

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