



Geodesic Dome Phased Array Antenna (GDPAA): An AFSCN Upgrade Option

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**1Lt Heather Moe
SCNG**



Overview

- **AFSCN Technology Gap**
- **Phased Array Antenna**
- **Basic GDPAA Operations**
- **Acquisition Timeline**
- **GDPAA – Development to Operations**



AFSCN Technology Gap

AFSCN Today

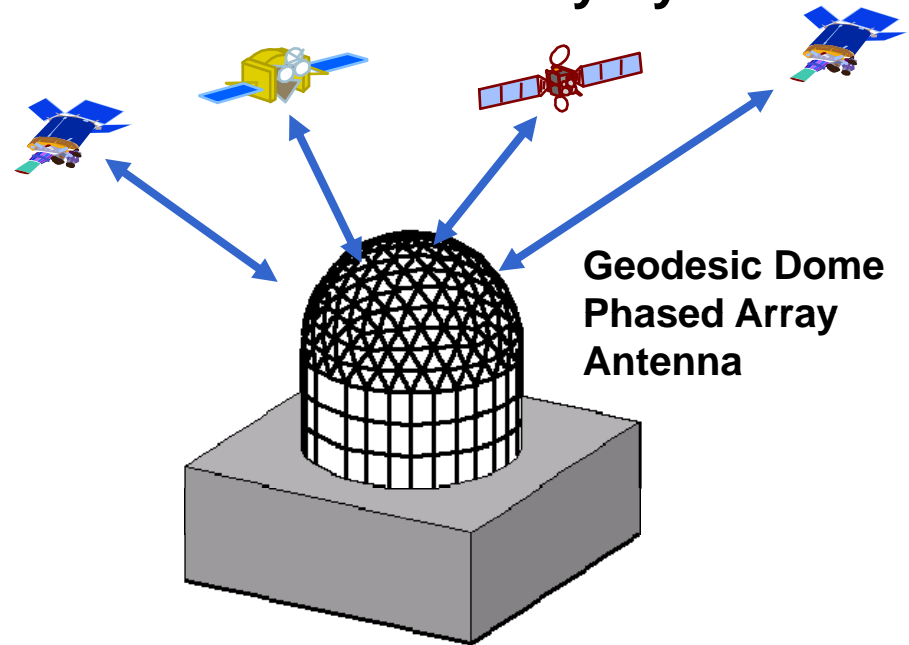


- 1 contact per antenna
- Mechanical scan
- Fixed gain
- Operator intensive/Manual
- High O&M cost
- Single points of failure



capacity
multiplier

Future Phased Array System



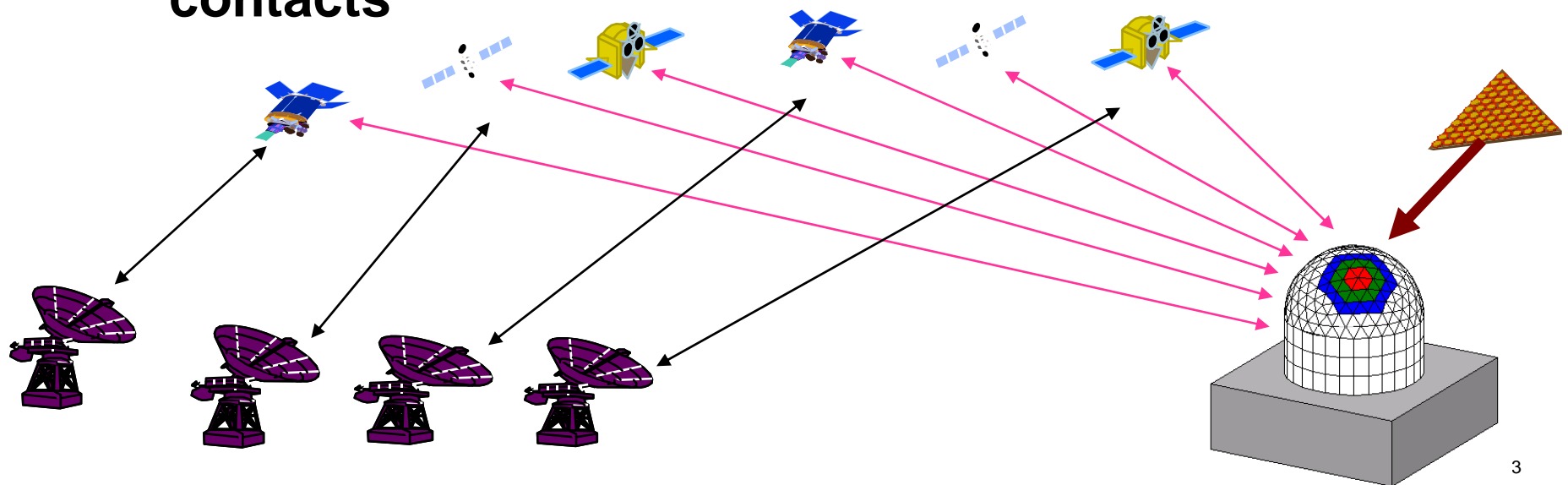
Geodesic Dome
Phased Array
Antenna

- Up to 4 contacts (8 beams) per antenna
- Electronic scan
- Variable gain on demand
- Programmable
- Low O&M cost
- Concurrent Maintenance with Ops



Phased Array Antenna

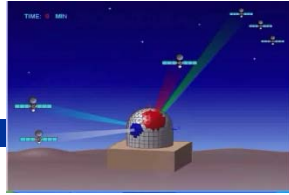
- **GDPAA is on track to be the next-generation ground antenna for the Air Force Satellite Control Network (AFSCN)**
 - **Designed for future SATOPS support - wide range of mission applicability**
 - **Responsive system for on-demand satellite contacts**





Phased Array Antenna cont.

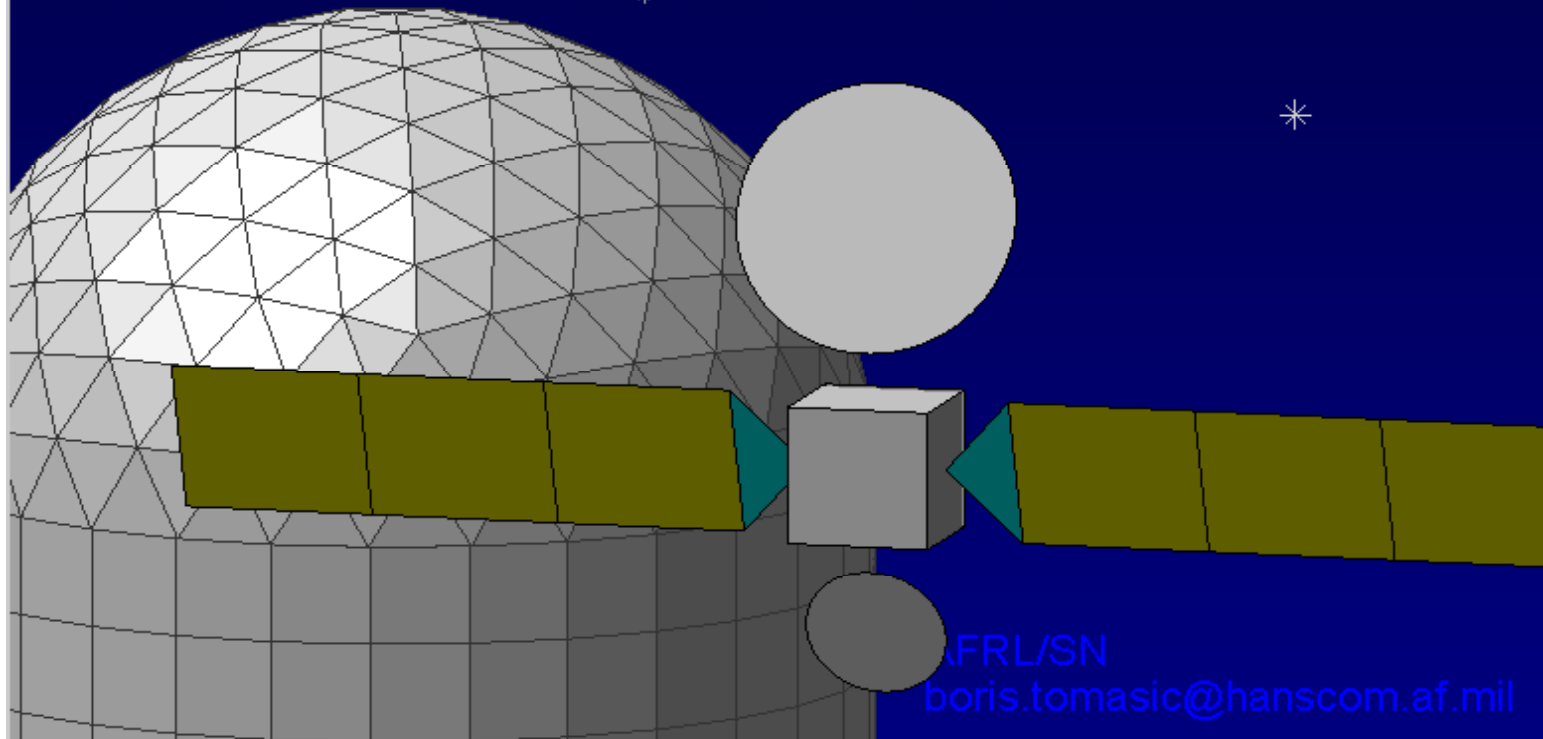
- **New technologies / Capabilities**
 - **Multiple satellite contacts on a single antenna**
 - **Built-in multi-band capability (L- & S-band)**
 - **Gain-on-demand for rapid anomaly resolution**
 - **No mechanical movement - Low O&M cost**



Basic GDPAA Operations

GEODESIC DOME PHASED ARRAY ANTENNA FOR SATOPS

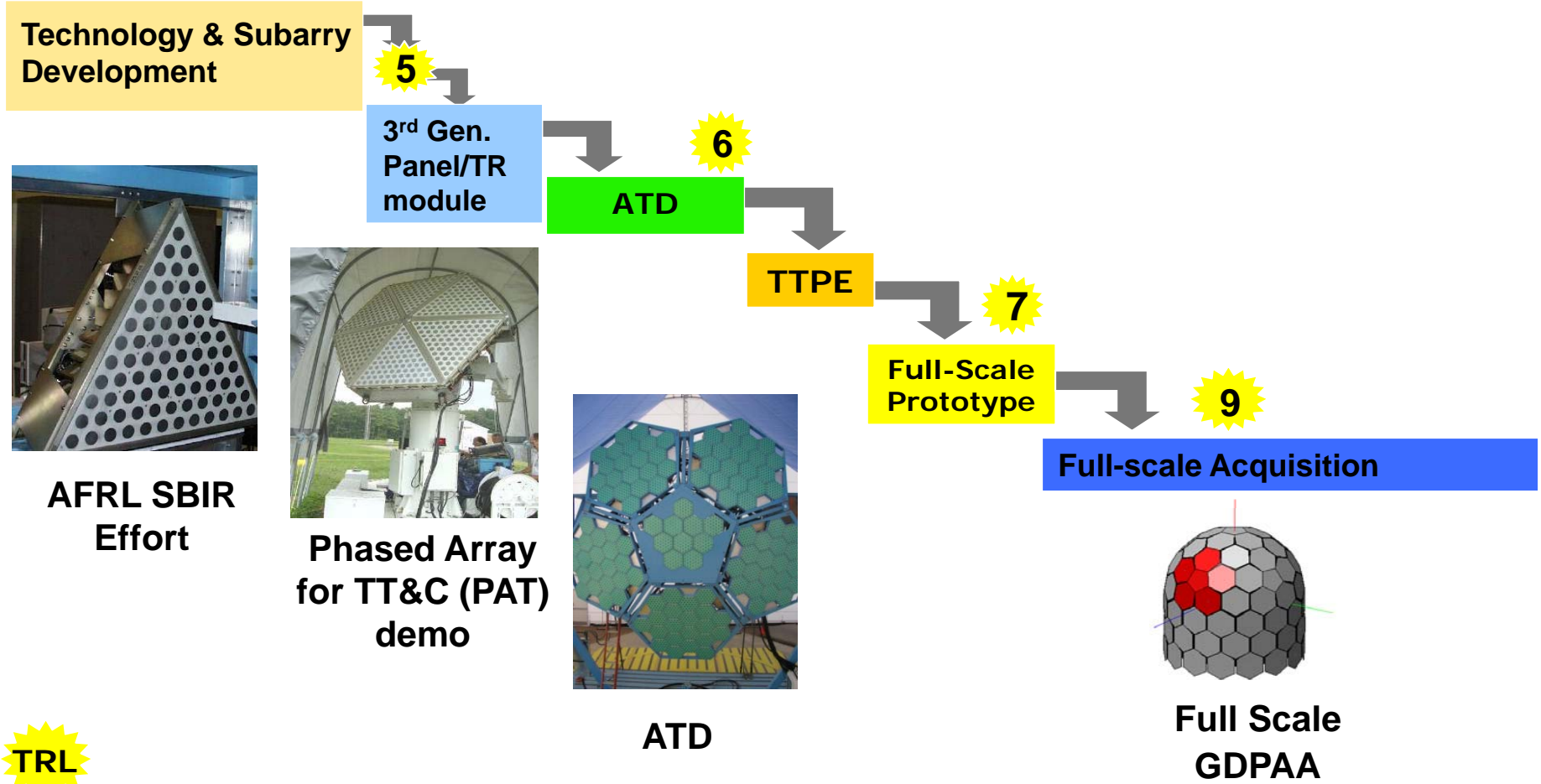
DIRECTOR / PRODUCER ... B. Tomasic





Acquisition Timeline

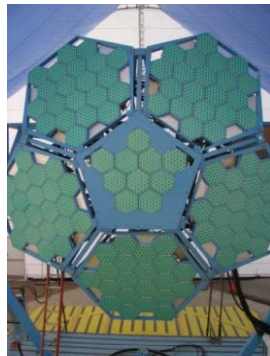
FY 99	FY 00	FY 01	FY 02	FY 03	FY 04	FY 05	FY 06	FY 07	FY 08	FY 09	FY 10	FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20	FY 21
Concept & Arch Development				Technology Development								EMD				Production & Deployment						



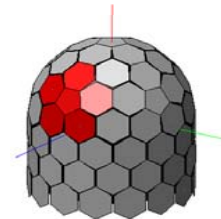
AFRL SBIR Effort



Phased Array for TT&C (PAT) demo



ATD



Full Scale GDPAA



GDPAA – Development to Operations

- **GDPAA ATD phase (FY07-09)**
 - **Met all 7 Key Performance Parameters (EIRP, simultaneous contacts, multi-band, concurrent maintenance, gain, tracking accuracy, field-of-view)**
- **GDPAA Technology Transition Program (TTP) (FY10-11)**
 - **Mitigate remaining technical issues from ATD and reduce programmatic risk**
- **Competitive prototype development (FY12-13)**
 - **System engineering and design of full scale GDPAA**
 - **Prototyping critical subsystems for testing, integration and demonstration**
- **Engineering and Manufacturing Development (EMD) phase of full-scale GDPAA (FY14-17)**
 - **Complete first full-scale GDPAA development and D/OT&E**
- **Production and deployment phase (FY17 and beyond)**



Questions?