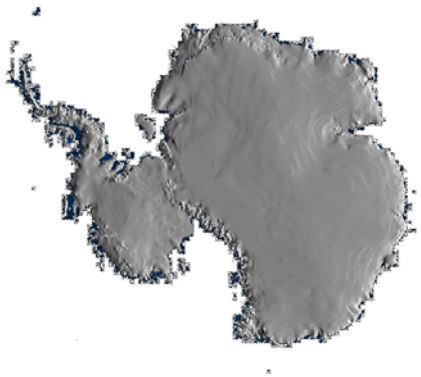


Raytheon Polar Services Company

UNITED STATES ANTARCTIC PROGRAM

SOUTH POLE WIRELESS LOCAL AREA NETWORK

Nicolas S. Powell

15 July 2002

Raytheon Polar Services Company
Denver, Colorado

WIRELESS LAN
2001-02 Results

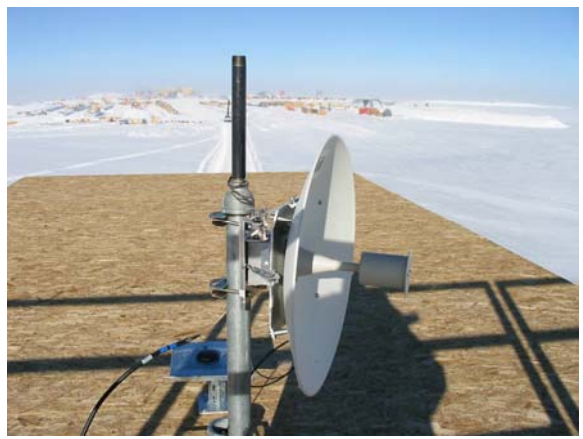
Raytheon Polar Services Company

- **Three Test Locations**
  - **SPRESO**
  - **Under Dome**
  - **Summer Camp**
- **Demonstration and proof of concept**
- **Limited funding for equipment purchase**
- **Evaluate effect on RF environment -**
  - **IEEE 802.11b spread spectrum signal in 2.4 GHz Part 15 portion of radio spectrum**
  - **Very low signal levels observed ~ -65 dBm 500 ft from Omni, -80 to -85 dBm at SPRESO supported 11 Mbps**
  - **Low power still supports good throughput**

WIRELESS LAN
2001-02 Results

Raytheon Polar Services Company

- **SPRESO**
  - **Point to Point RF Bldg to SPRESO (~ 6 km)**
  - **Equipment Configuration**
    - Parabola antenna on RF Bldg (21 dBi gain)
    - Yagi antenna at SPRESO (13.5 dBi gain)
    - Cisco 340 series bridges at each end
  - **Provided site Voice over IP phone & e-mail services**
  - **Near 100% connectivity - very reliable**
  - **Data rate - 11 Mbps**



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WIRELESS LAN
2001-02 Results

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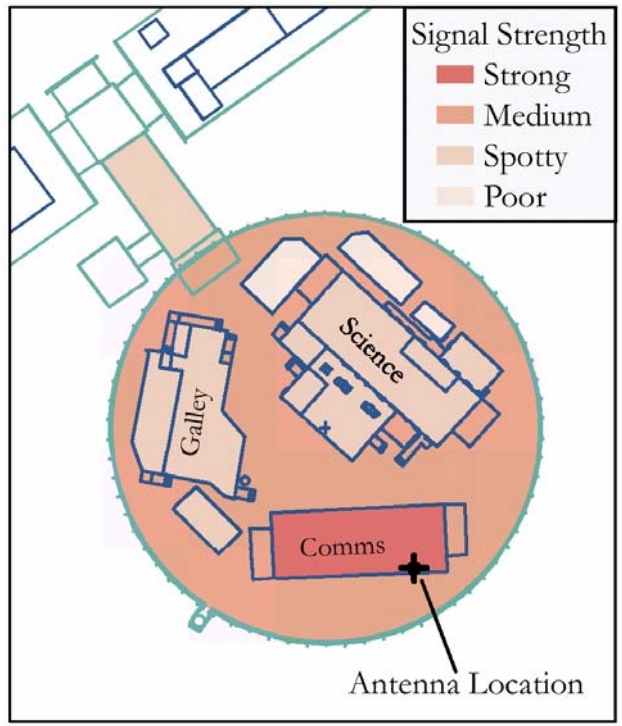
- **Under Dome**
  - **Spotty coverage with number of fade zones**
  - **One flat panel, semi-directional antenna and Cisco 350 series Access Point inside Comms Bldg**
  - **Metal structure of buildings limited performance, particularly with one antenna located inside**



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WIRELESS LAN 2001-02 Results

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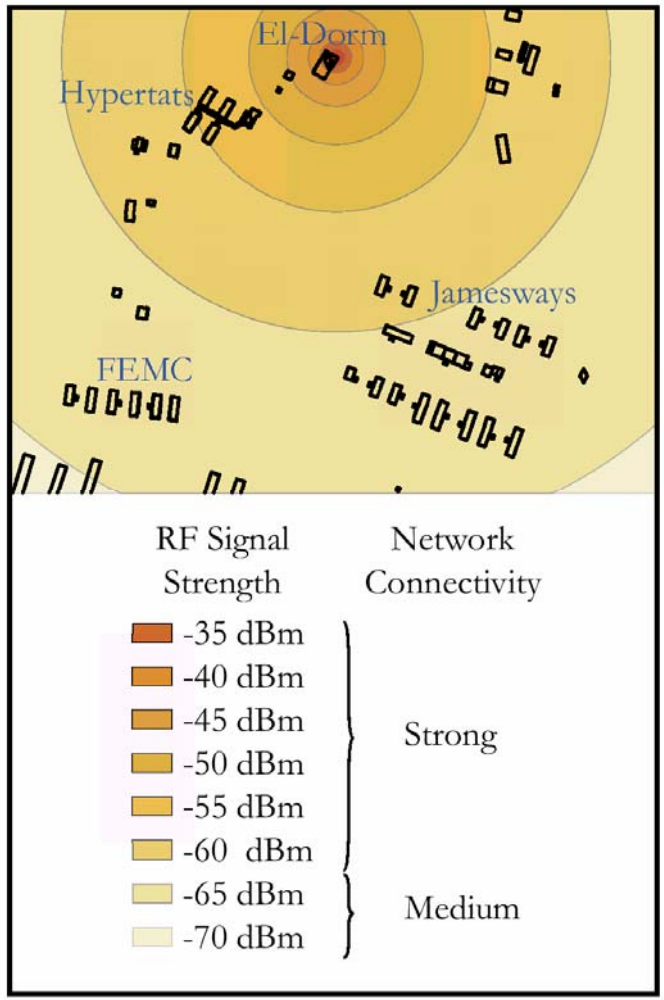
- **Summer Camp**
  - **Omni Antenna (12 dBi) on top of El Dorm**
  - **Cisco 350 series Access Point in El Dorm**
  - **Users report relatively poor performance in Summer Camp and no signal in Hypertats**



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WIRELESS LAN
2002-03 Plans

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- **Four WLAN nodes**
  - **SPRESO**
  - **Dark Sector**
  - **Under Dome**
  - **Summer Camp**
- **Supports remote sites with no wireline connectivity during summer**
- **SPRESO support ends with wireline installation completion this summer**

WIRELESS LAN - 2002-03
SPRESO Architecture

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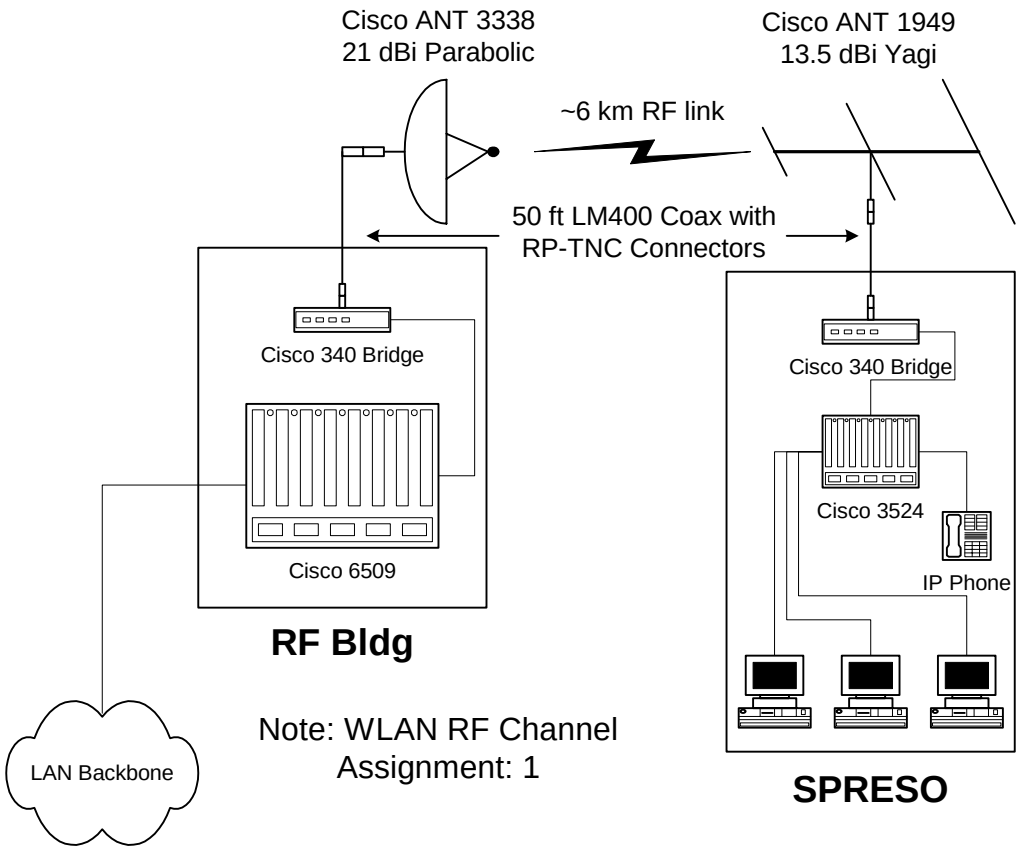

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WIRELESS LAN 2002-03
Dark Sector Architecture

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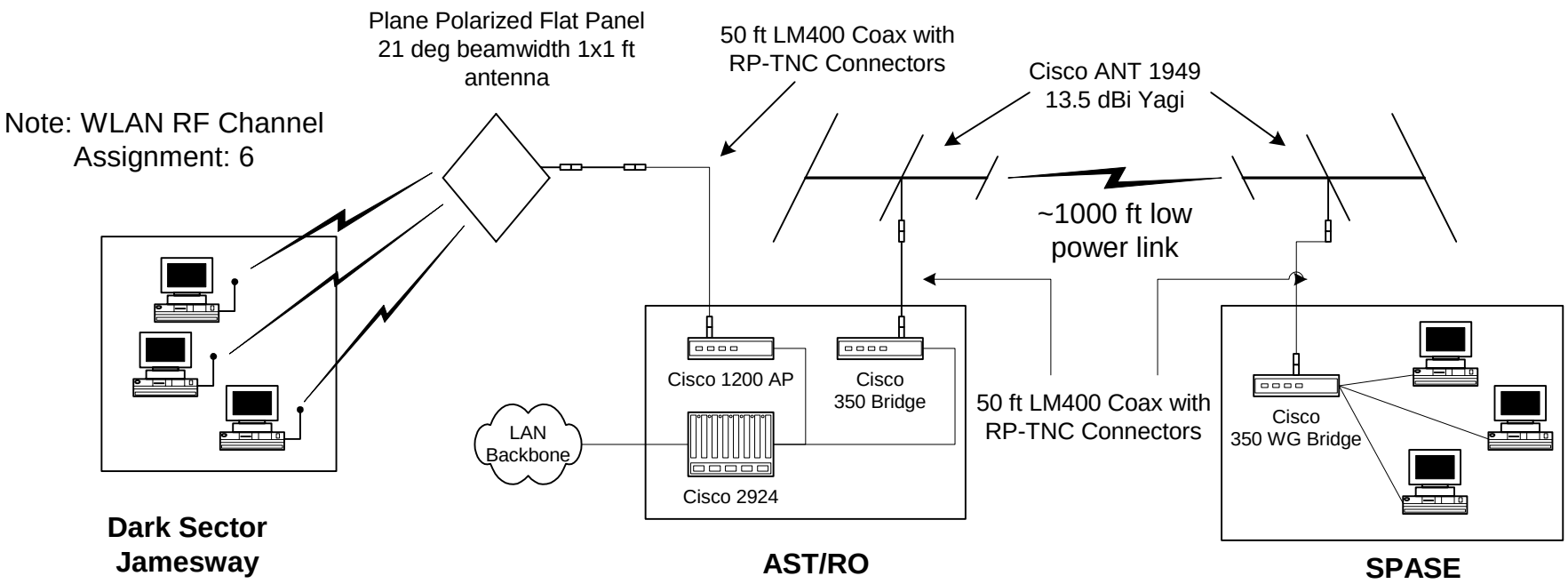

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WIRELESS LAN 2002-03
Under the Dome Architecture

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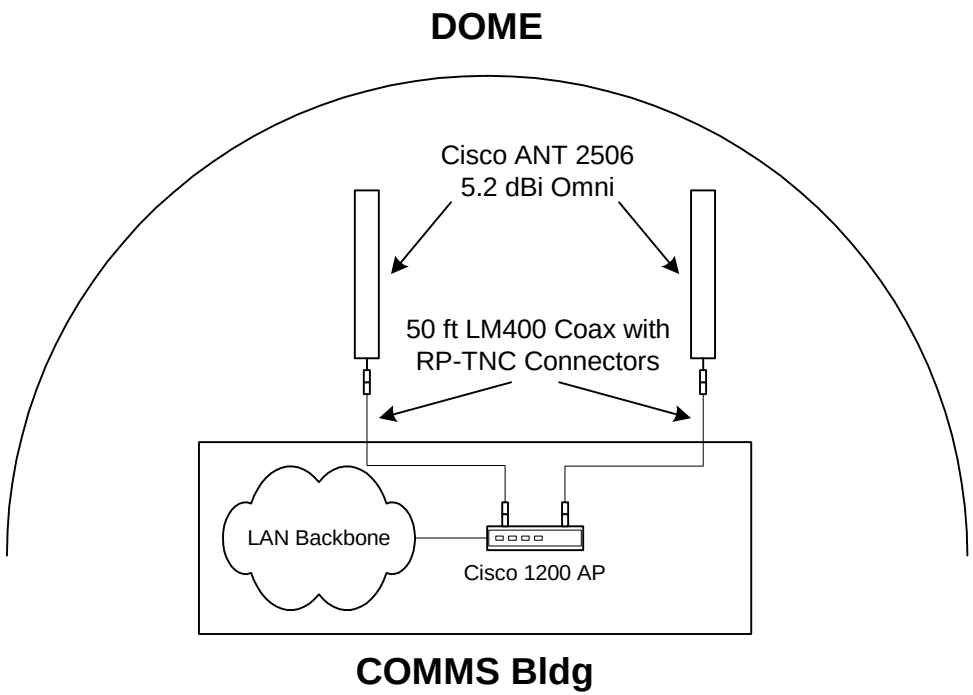

Note: WLAN RF Channel Assignment: 1

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WIRELESS LAN 2002-03
Summer Camp Architecture

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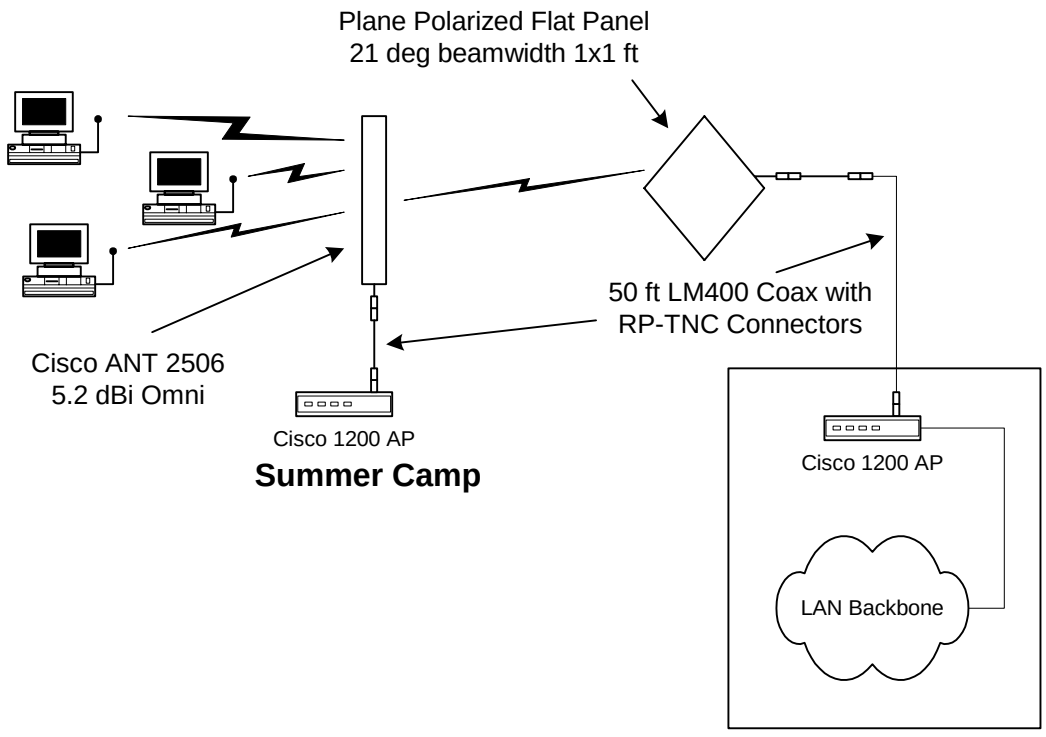

Note: WLAN RF Channel Assignment: 11

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