Global Ground Station Survey

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Outline

• Results Summary
• Capacity Modeling
• Future Work
Thank you to our current participants

104 Registered Institutions

98 Stations

291 Individual Antenna Systems
Types of Antennas

- **Yagi**: 176
- **Dish**: 64
- **Omni**: 35
- **Other**: 16

Antenna Type

(Bar chart showing the number of each type of antenna)
Gain Distribution

Gain (dB)

3 6 10 13 16 19 22 26 29 32

43 11 15 43 65 13 9 2 4 2

Gain Distribution
Operational Bands

Band

UHF  VHF  L  S  C  X  Ku  K  Ka

104  97  31  39  8  5  5  1  1
Worldwide UHF/VHF Station Map

104 Stations
• Baseline Astronautical Development LLC Helium-100 UHF/VHF Transceiver
  – At least 40 kbps

• ~50 Gb excess daily downlink capacity
• Baseline SpaceQuest TX-2400
  – 1 Mbps

• ~370 Gb excess daily downlink capacity
• ~13.5 Tb data per year!

Image courtesy of SpaceQuest, Ltd
• 700 km sun synchronous orbit
• Considering both dynamic station availability and ground track - average 1.7 “good” passes per orbit.
  – “Good” pass average 12 minute window

• ~2.3 Gb per day peak downlink capacity
Future Work

• Maintain survey as ongoing repository of GS information
• Some dubious initial entries, need to clean-up and verify stations
• Identify subset of ideal stations, conduct detailed case study of availability, improved temporal predictive capacity model
• Make results publicly available
  – Web interface for querying database
Please Participate!

http://ssdl.stanford.edu/gs_survey/

Username: gs
Password: stanford