

### COSMIC PARTICLE IGNITED PLASMA MIRROR

A plasma mirror at 90,000 feet over a city will efficiently reflect communications signals (patents pending). This ionized plasma layer specularly reflects between 80 to 90 % of signal in desired bands. It will be available for frequencies below 2 GHz as well as S-band, C-band, X-band and Ku-band. The channel capacity will be between: 2-20 Megabits per second, with a signal level of -50 DBm (equivalent to 4 bars on cell phone) at a radius of 200 kilometers. One reflector could provide mobile phone coverage for an area the size of New Mexico or Iraq.

### BROADCAST MODE

Qualcomm and Verizon are teaming to provide TV signals to cell phones. To do this, they have purchased FM television station rights and are planning to broadcast from an antenna on Black Mountain in San Diego county at 715 Mhz. The CIPPA system (Patents Pending) proposed here will broadcast from 90,000 feet, rather than the 1200 foot altitude of black mountain. This will provide much better coverage.

### Broadcast Mode Performance Estimates

- Parameters
  - Transmit Power 500 watts
  - Phased Array Radius 160 m
  - Receiver Antenna Area 3 m<sup>2</sup>
  - Plasma Mirror Cross Section 714 m<sup>2</sup>
  - Plasma Mirror Reflectivity 0.8
  - Mobile Receiver Location 300,000 meters
  - Plasma Mirror Altitude 30,000 meters
  - Transmit frequency 1.9 Ghz
- Performance based on Bi-Static Radar Approximation
  - Received power  $4.2 \times 10^{-9}$  watts (-83dBw, -54dBm)
  - Channel Capacity  $1 \times 10^7$  bits per second

### Bi-Directional Mode Performance Estimates - Mobile to Base

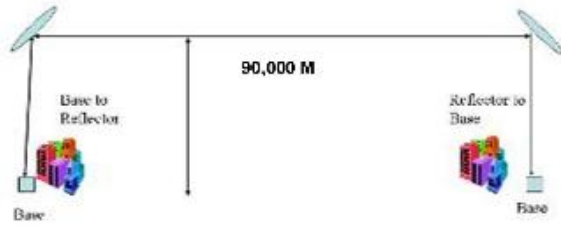
- Parameters
  - Transmit Power 5 watts
  - Plasma Mirror Cross Section 714 m<sup>2</sup>
  - Base Station Array Radius 160 m
  - Transmit Antenna Area 3 m<sup>2</sup>
  - Plasma Mirror Reflectivity 0.8
  - Mobile Receiver Location 300,000 meters
  - Plasma Mirror Altitude 30,000 meters
  - Transmit frequency 1.9 Ghz
- Performance based on Bi-Static Radar Approximation
  - Received power  $4.2 \times 10^{-11}$  watts (-104dBw, -78dBm)
  - Channel Capacity  $2.0 \times 10^6$  bits per second

### LONG HAUL

Long haul communications can be accomplished with two plasma mirrors located 1600 miles apart. This system could be much less expensive than cable or optical fiber long haul communication



### CIPPA: Long Haul Communications



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