CM Airborne Telepresence Requirements

- One person ops -- Suitcase size
- 10 km radius coverage -- 4 hr
- VTOL, horizontal flight, hover
- 1cm res @ 200m -- 10cm @2000m
- 10cm geolocation accuracy
- 10,000 pixel swath
- 18MP single frame
- Real-time image downlink
- HMD and hand controller
- $10,000 manufacturing cost
Decimeter GPS
Today: ~3m for <$1000

Key errors:
- Ionosphere: 1-3m
- Ephemeris: 1-2m
10-DOF motion sensing

GPS + IMU > attitude sensing

1990 ($100K)

2000 ($30K)

2010 ($1.5K)
Directional Antennas

Each 6dB gain doubles range

16dB gain
10 deg beamwidth
Adaptive Airframe Controller

Acceleration
Control deflection
Rotation rate
Unlimited CPU

ARM has changed everything!

Avionics Development Laboratory

Fully-integrated avionics package

- 100MHz Cortex M3 CPU development board ($69)
- OEM615 GPS ($1000)
- ADIS16488 ($1500)
- Power monitor
HMD Controller

Head movement controls camera pointing in hover

“Google Glass is actually a fairly full-blown computer”