

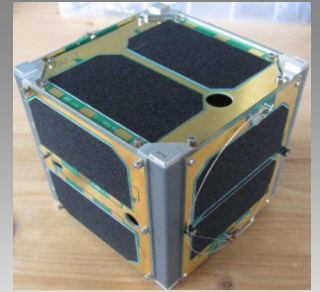
Amateur Satellites

in 15 minutes

Umesh Ghodke, K6VUG

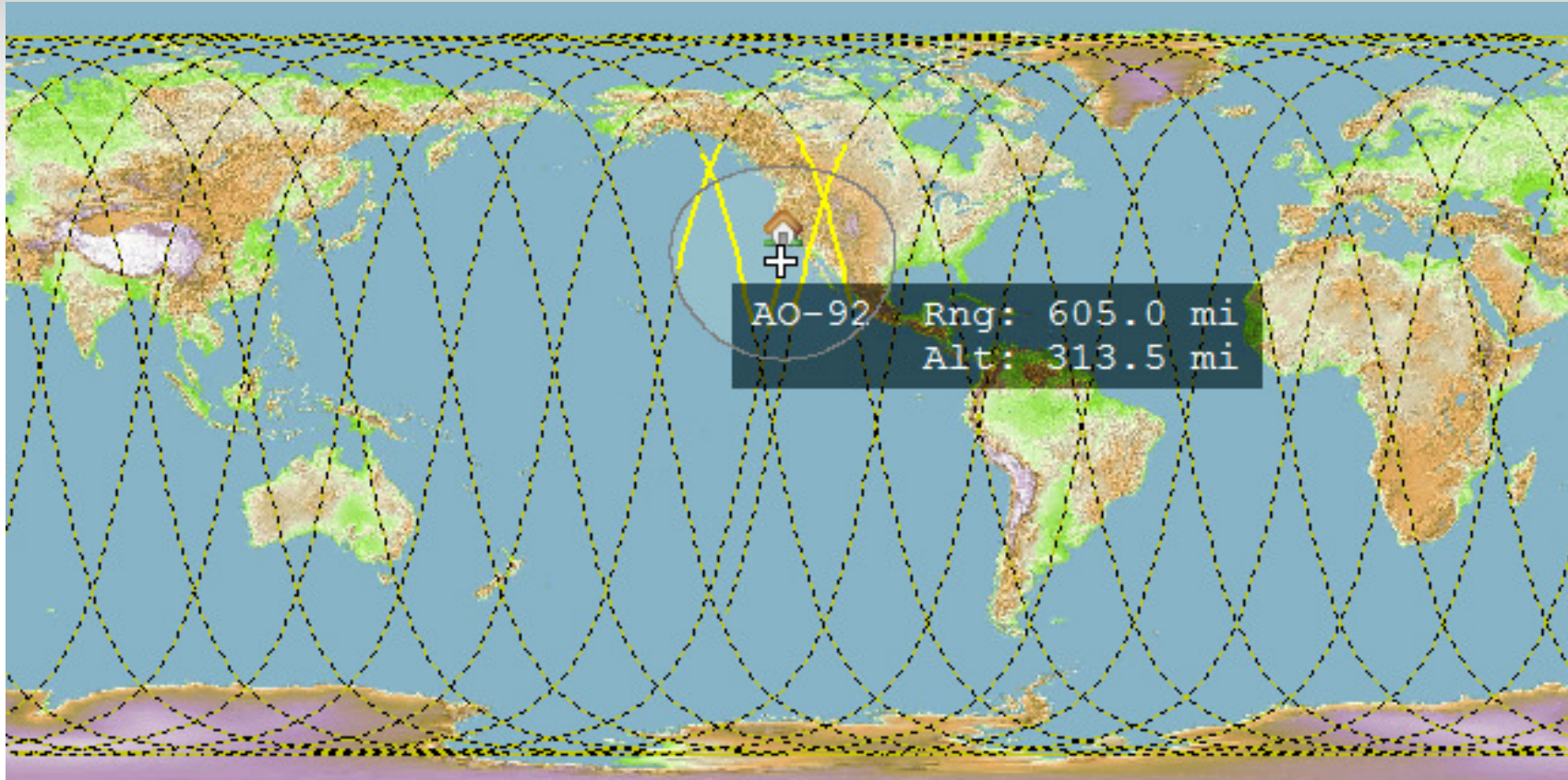
May 2019

Amateur Satellites



- Cube Sats & ARISS (Amateur Radio aboard ISS)
 - Cube Sats are typically 10 cm x 10 cm x 10 cm
- Orbits 300 to 400 miles above Earth
- Average rotation time about 90 minutes
- Typical pass lasts about 11 minutes
- Passes are predicted per Grid Square
- Foot-print (Area of Illumination) = Size of US

Typical Passes & Footprint



Satellite Modes & Frequencies

- Full Duplex for Voice/CW, Simplex for Packet
- Full Duplex Uplink and Downlink on different bands - VHF/UHF, UHF/VHF, etc.
- Single channel Repeater for FM
- Multiple channel Transponder for SSB/CW
- Active Satellites & Frequency Chart available at AMSAT.org and other web sites

Radio & Antenna for Satellites

- One Full Duplex or Two Simplex Radios
 - HT or mobile OK, Transmit power 5 to 20 watts
 - Use Headphones to avoid audio loopback
- Directional Antenna works best
 - Yagi or Log-Periodic recommended
 - Tripod optional for portable operation
 - Manual Phase Adjustment for portable station
 - RHCP antenna recommended for fixed station

FM Radio Memory Channels

| Name | Rx Freq | Rx Tone | Tx Freq | Tx Tone |
|-------------|----------------|-------------|----------------|-------------|
| AO91-3 | 145.965 | None | 435.235 | 67.0 |
| AO91-2 | 145.960 | None | 435.240 | 67.0 |
| AO91-1 | 145.960 | None | 435.245 | 67.0 |
| AO91 | 145.960 | None | 435.250 | 67.0 |
| AO91+1 | 145.960 | None | 435.255 | 67.0 |
| AO91+2 | 145.960 | None | 435.260 | 67.0 |
| AO91+3 | 145.955 | None | 435.265 | 67.0 |

Tracking and Listening

- Setup few minutes before the pass
- Use visual markers for AOS, LOS & Peak
- Fully open Squelch for FM Receiver
- Point the antenna at AOS Azimuth and Wait...
- Point & turn the antenna “very slowly” along the pass for the strongest signal
- Change RX frequency for clear conversation

Making Contacts !

- Exchange is Grid Square
- Write down Calls as you hear them

Call CQ or

K6VUG CM97

Call Station Heard

KI6IUJ K6VUG CM97

Get Grid Square

K6VUG KI6IUJ DM13

Give Your QSL

KI6IUJ K6VUG CM97 QSL 73

Get QSL

QSL 73

Thank You !

Questions & Comments

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References:

- [AMSAT \(www.amsat.org\)](http://www.amsat.org)
- [Live Tracking \(www.n2yo.com\)](http://www.n2yo.com)
- [QST April 2000 Article \(www.arrl.org\)](http://www.arrl.org)