

FAA

Flight Standards Assessment

**Workshop for the
Preliminary Staff Assessment
Carlsbad Energy Center Project
(07-AFC-6)**

January 8, 2009

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Flight Standards Division
Los Angeles, CA

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Industrial Plumes

- Federal Aviation Regulation 14 CFR part 77 considers only the physical structure of a power plant for airspace case studies.
- No statutory authority to study exhaust plumes or declare as a hazard to navigation

Safety Risk Analysis

- FAA 2006 Safety Risk Analysis (SRA) of industrial plumes
- 30 year review: no accidents or incidents could be attributed to overflight of an industrial plume
- SRA assessed risk @ 1×10^{-9}
- Target Level of Safety of 1×10^{-7}

SRA Recommendation

- In spite of low level of risk, overflight of an industrial plume is not without risk.
- Pilots should avoid overflight of an industrial plume at altitudes <1000 feet above the plume source.

Encina Location

- Site elevation: 65 feet (rounded to 100 feet)
- Assumed stack height: 100 feet
- SRA recommendation: avoid <1000 feet above source
- Height to avoid:
 - $100 + 100 + 1000 = 1200$ feet
- Arrivals/departures typically > 1200 feet over Encina

Business Park Locations

- Average site elevations: 472 feet (500)
- Assumed stack height: 100 feet
- SRA recommendation: avoid <1000 feet above source
- Height to avoid:
 - $500+100+1000 = 1600$ feet
- Palomar traffic pattern altitude: 1500 feet

Plume Mitigations

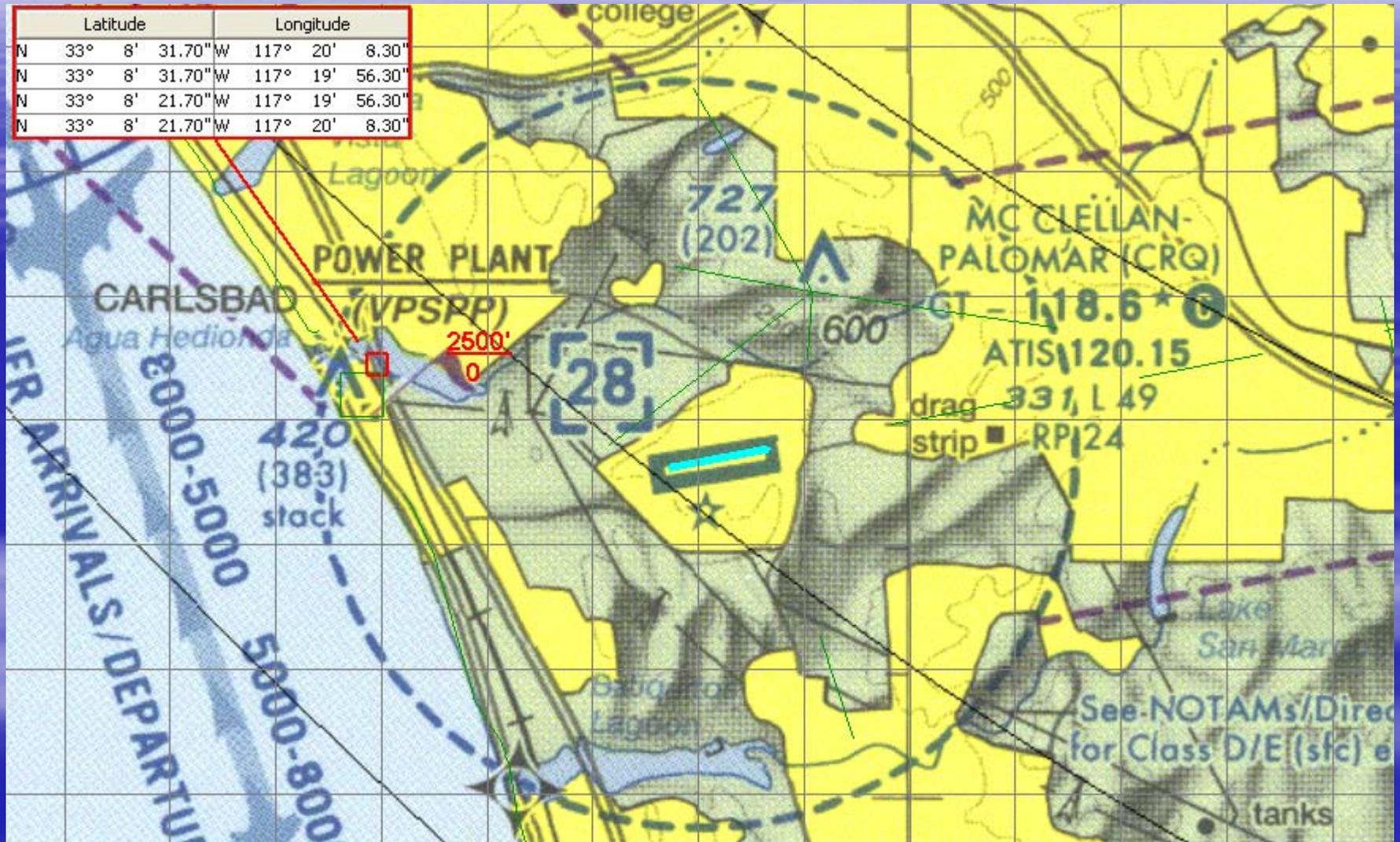
- “See and avoid” is an acceptable mitigation
 - When there is sufficient time for pilots to locate the source on the ground, and
 - There is sufficient airspace to climb or maneuver to avoid overflight < 1000 feet.
- “See and avoid” is not reasonable nor feasible for pilots in an airport traffic pattern.

Mitigation Requirements

- Proponent/airport publish pilot education materials
 - Location of plume
 - Recommended procedures to avoid
- Airport Facilities Directory note
- Notice to Airmen
- Automated Terminal Information Service

Proposed Plant Location (red box)

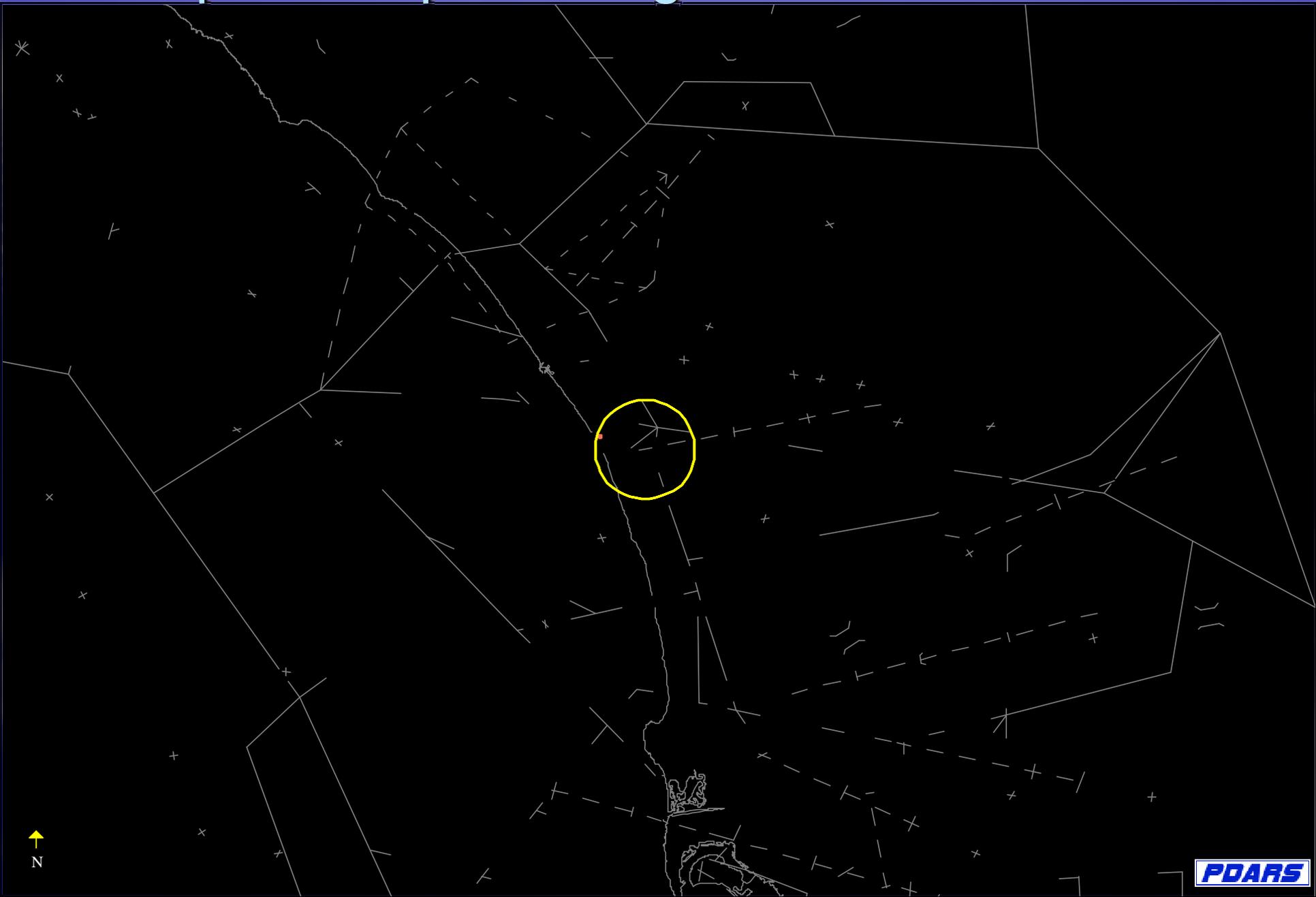
	Latitude	Longitude
N	33° 8' 31.70"W	117° 20' 8.30"
N	33° 8' 31.70"W	117° 19' 56.30"
N	33° 8' 21.70"W	117° 19' 56.30"
N	33° 8' 21.70"W	117° 20' 8.30"



Proposed Alternate Locations



Airspace map showing extraction locations



Palomar Airport Class "D"

Yellow - Palomar Airport Class "D" core

Green - Class "D" extension

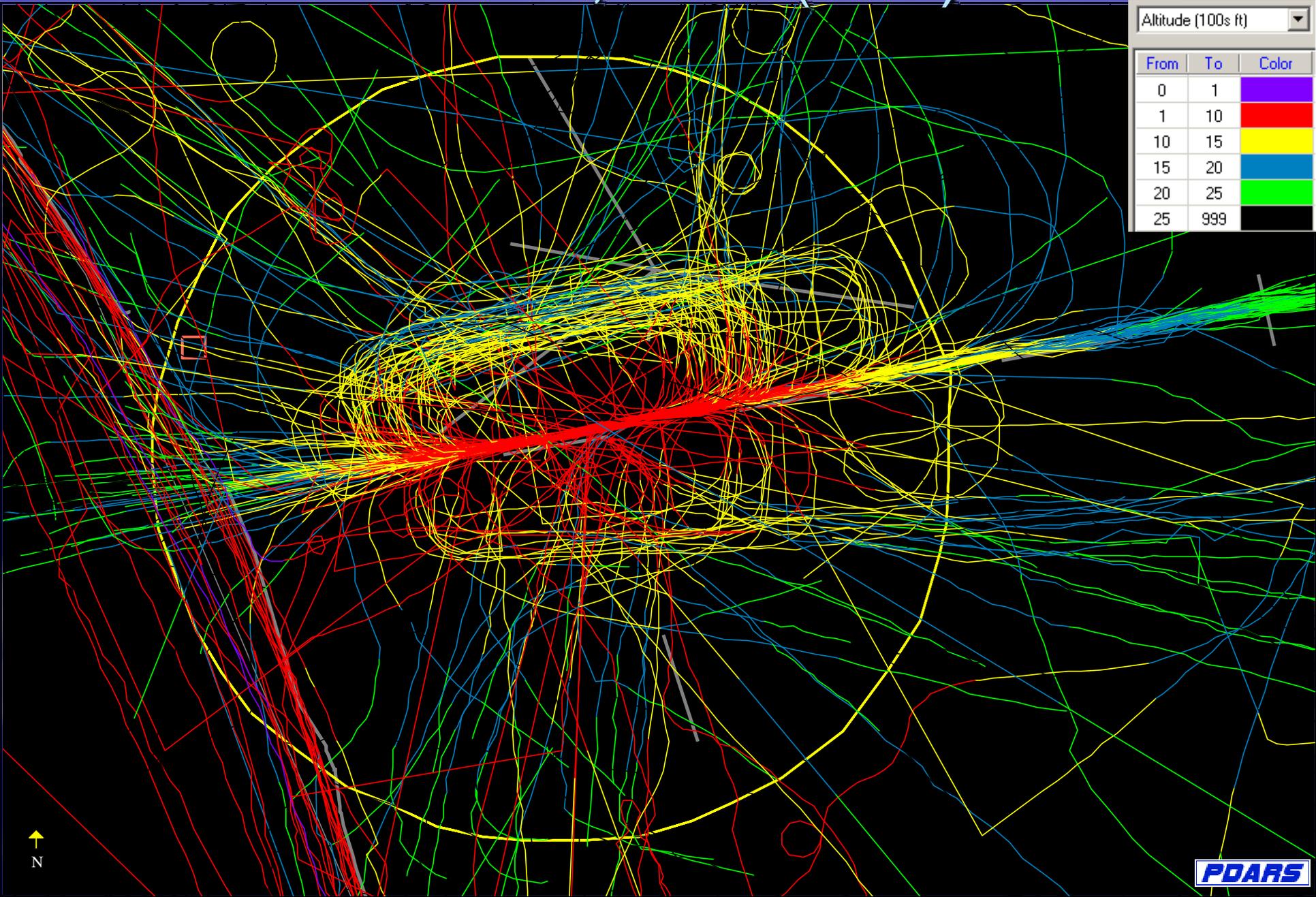
Small orange squares - proposed locations

note: approximate 1000' squares centered on sites

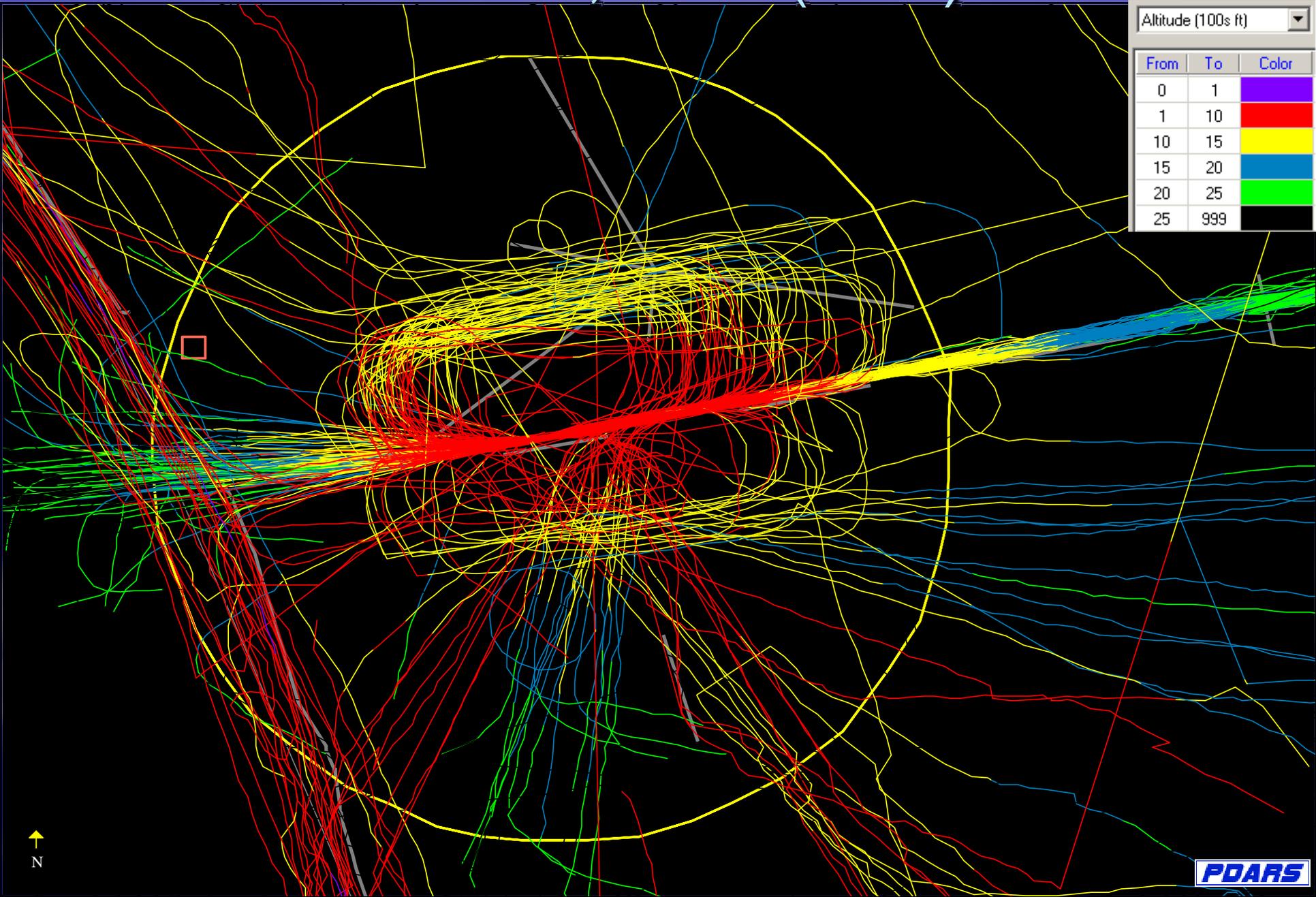


N

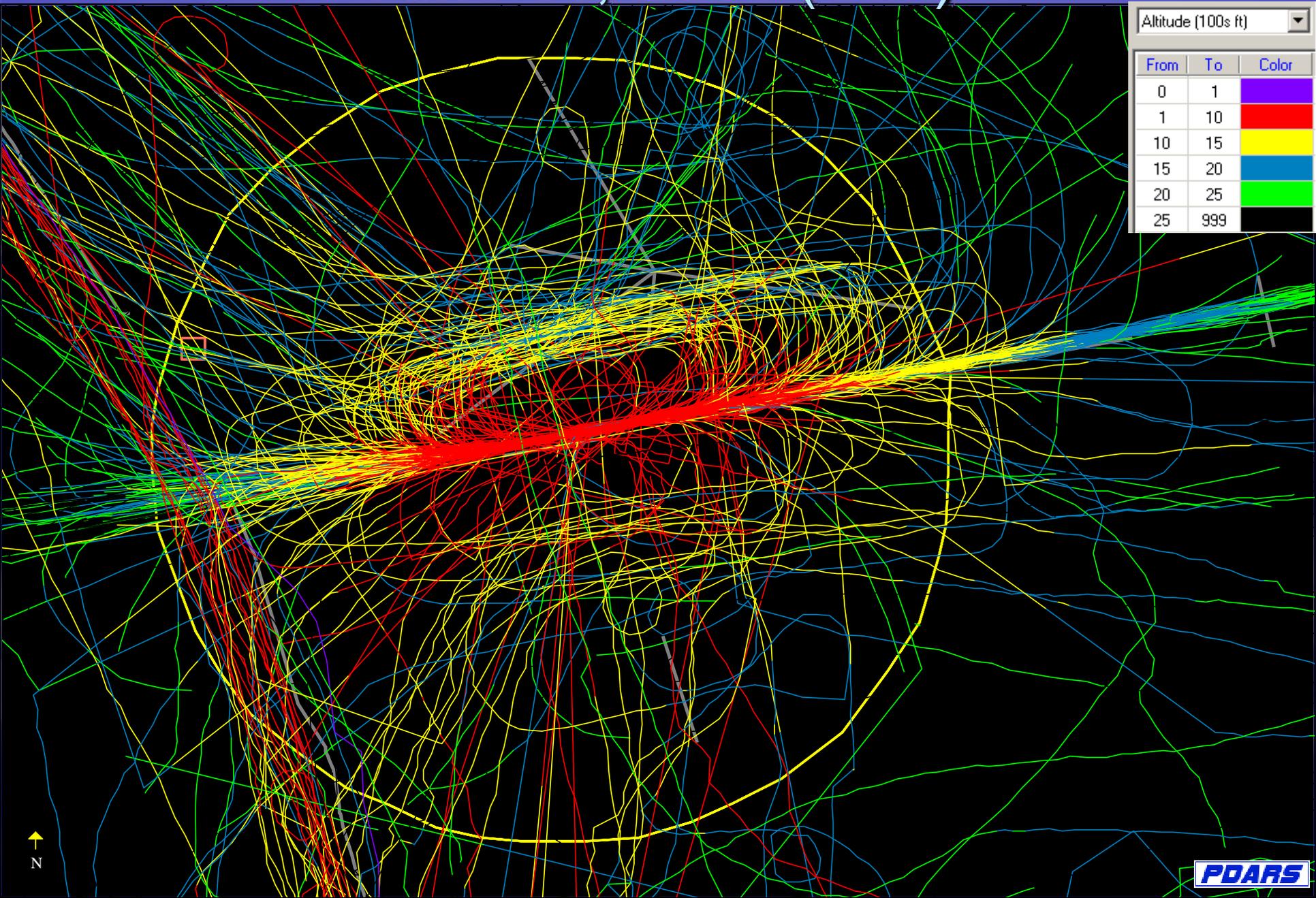
June 02, 2008 (Mon)



June 04, 2008 (Wed)



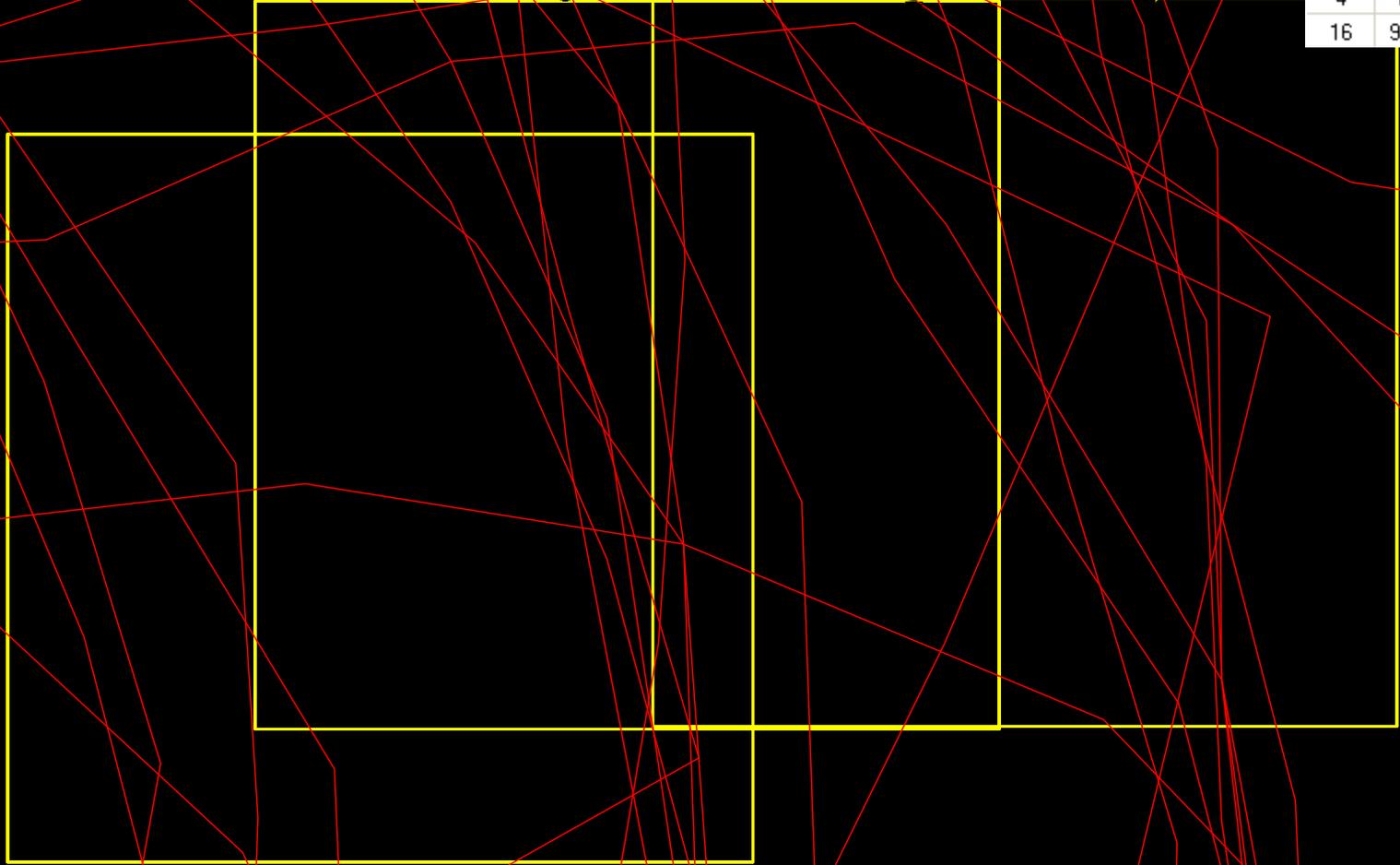
June 15, 2008 (Sun)



June 2, 2008 (Mon)

Altitude (100s ft) ▾

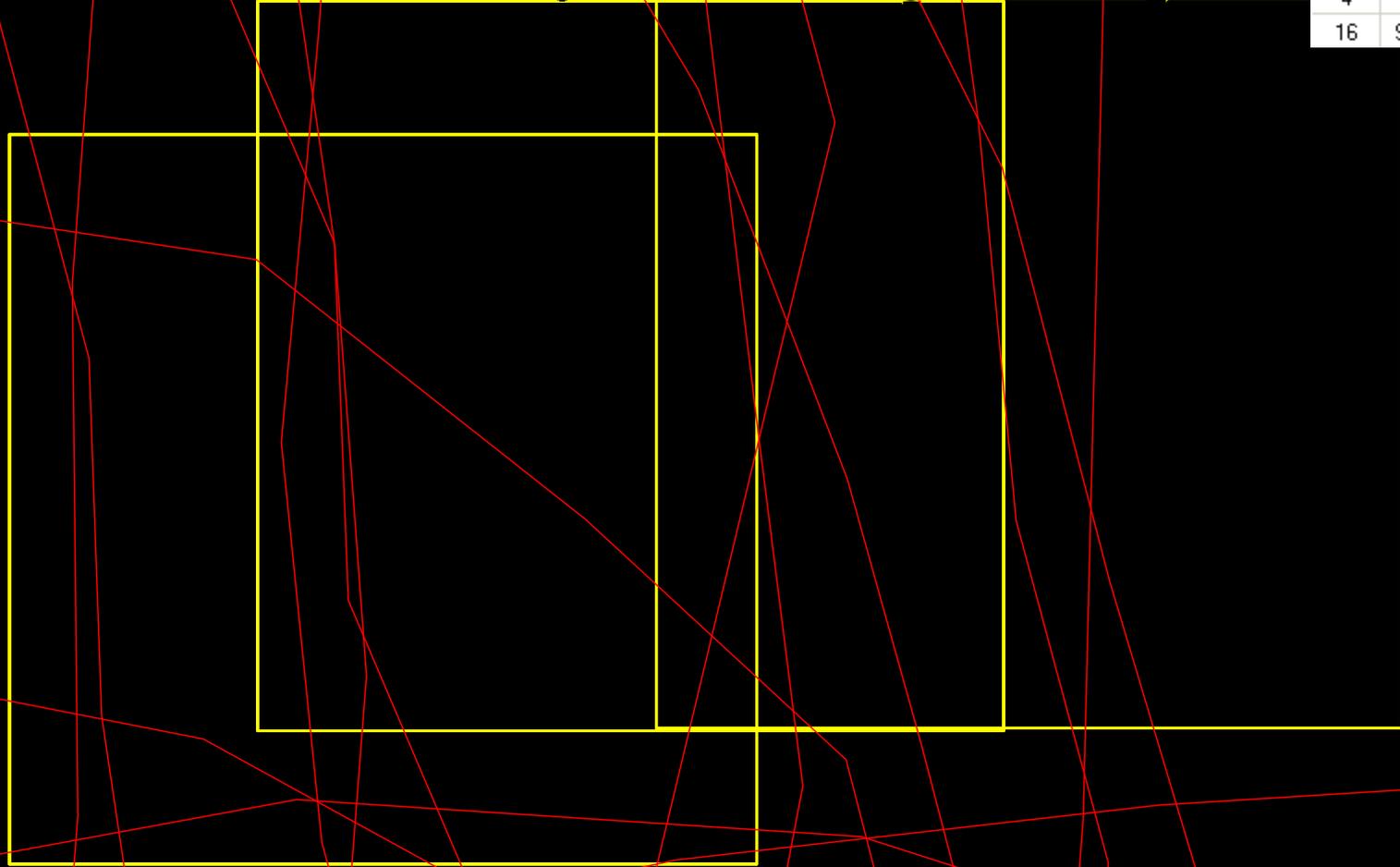
From	To	Color
0	1	Blue
1	4	Yellow
4	16	Red
16	999	



June 4, 2008 (Wed)

Altitude (100s ft) ▾

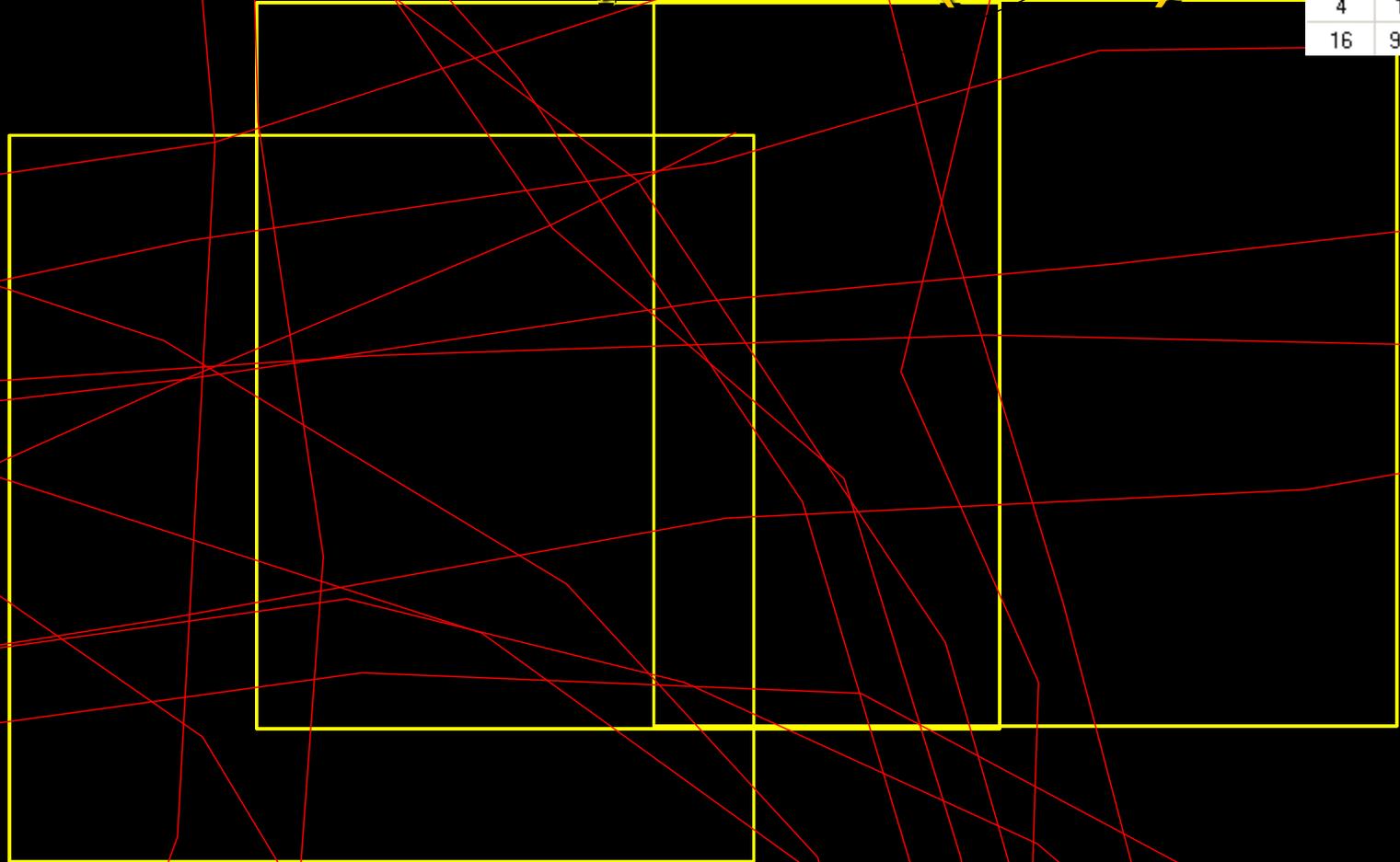
From	To	Color
0	1	Blue
1	4	Yellow
4	16	Red
16	999	



June 15, 2008 (Sun)

Altitude (100s ft) ▾

From	To	Color
0	1	Blue
1	4	Yellow
4	16	Red
16	999	



N

