

# LA 2020 Results

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UAT-WP-8-09  
Presented to UAT MOPS WG

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# LA 2020 Assumptions

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- Link 16 Baseline, option B - no antenna effects
- No DMEs
- UAT self-interference
- Co-site 1030, 1090, DME, UAT transmissions assumed to prevent reception during time of transmission
- Several altitude options
  - ◆ Highest # of other aircraft in view (usually FL300-400)
  - ◆ FL150
  - ◆ Ground
- Transmit Powers
  - ◆ A0/A1: 38.5-42.5 dB
  - ◆ A2: 42-46 dB
  - ◆ A3: 50-54 dB

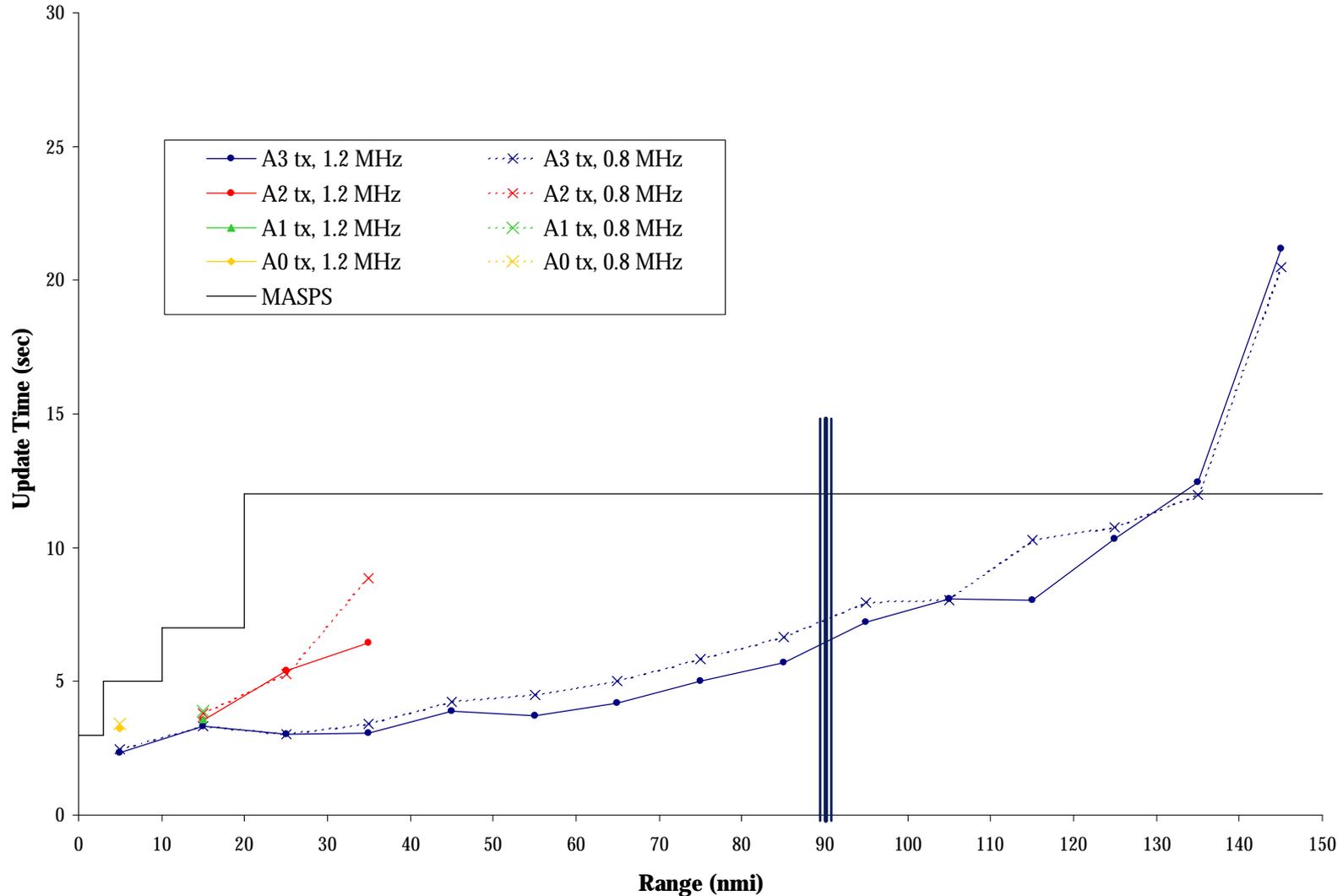
# LA 2020 Assumptions II

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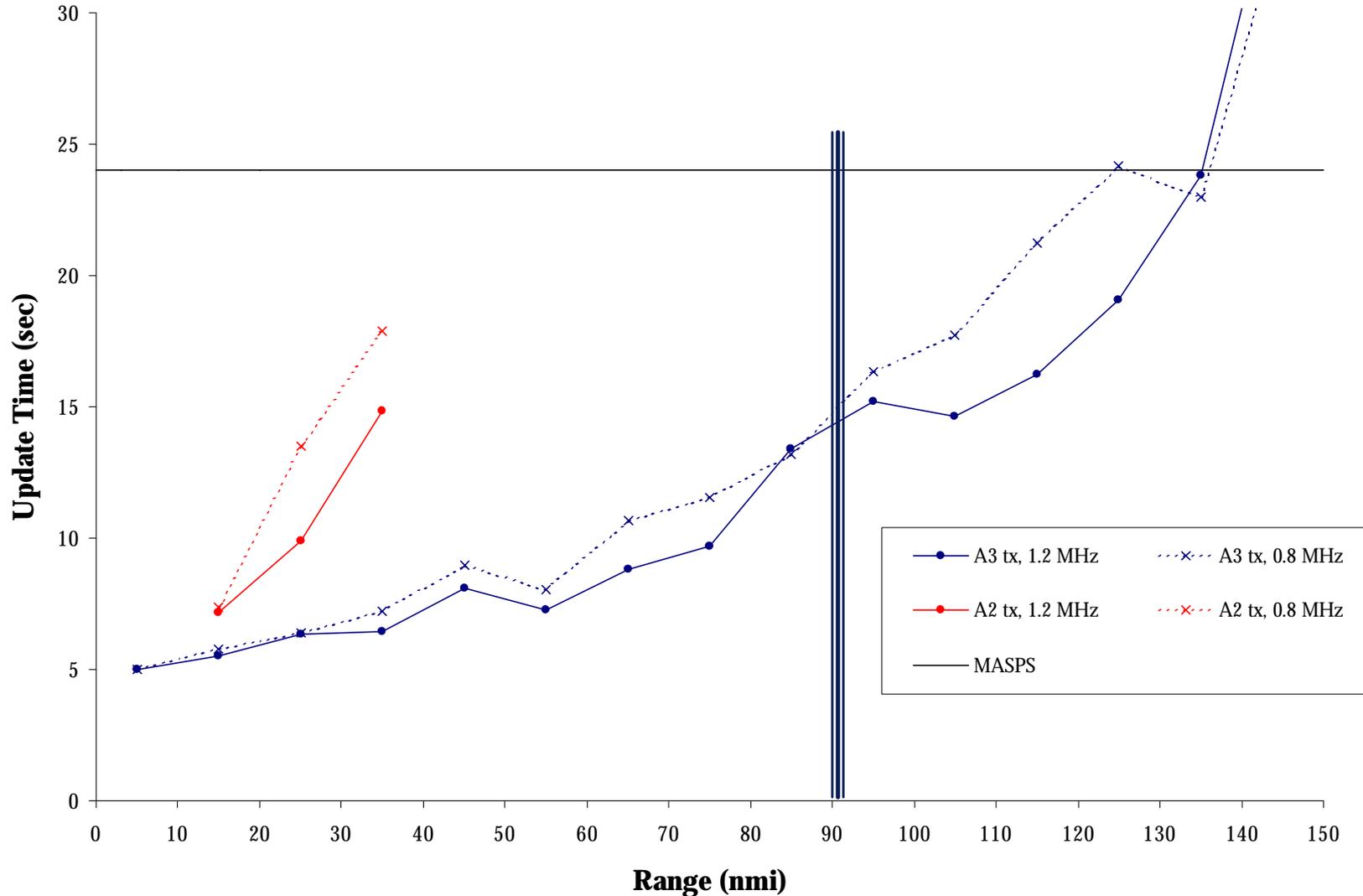
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- Several receiver configuration options
  - ◆ Diversity receivers
  - ◆ Switched receiver
  - ◆ A0 bottom only
  - ◆ Ground receiver
- A0 restrictions
  - ◆ Up to FL180
  - ◆ Switches Tx/Rx between antennas
- Receive filters
  - ◆ Diversity receivers evaluated for both 0.8 MHz and 1.2 MHz
  - ◆ Switched receivers evaluated for 1.2 MHz only

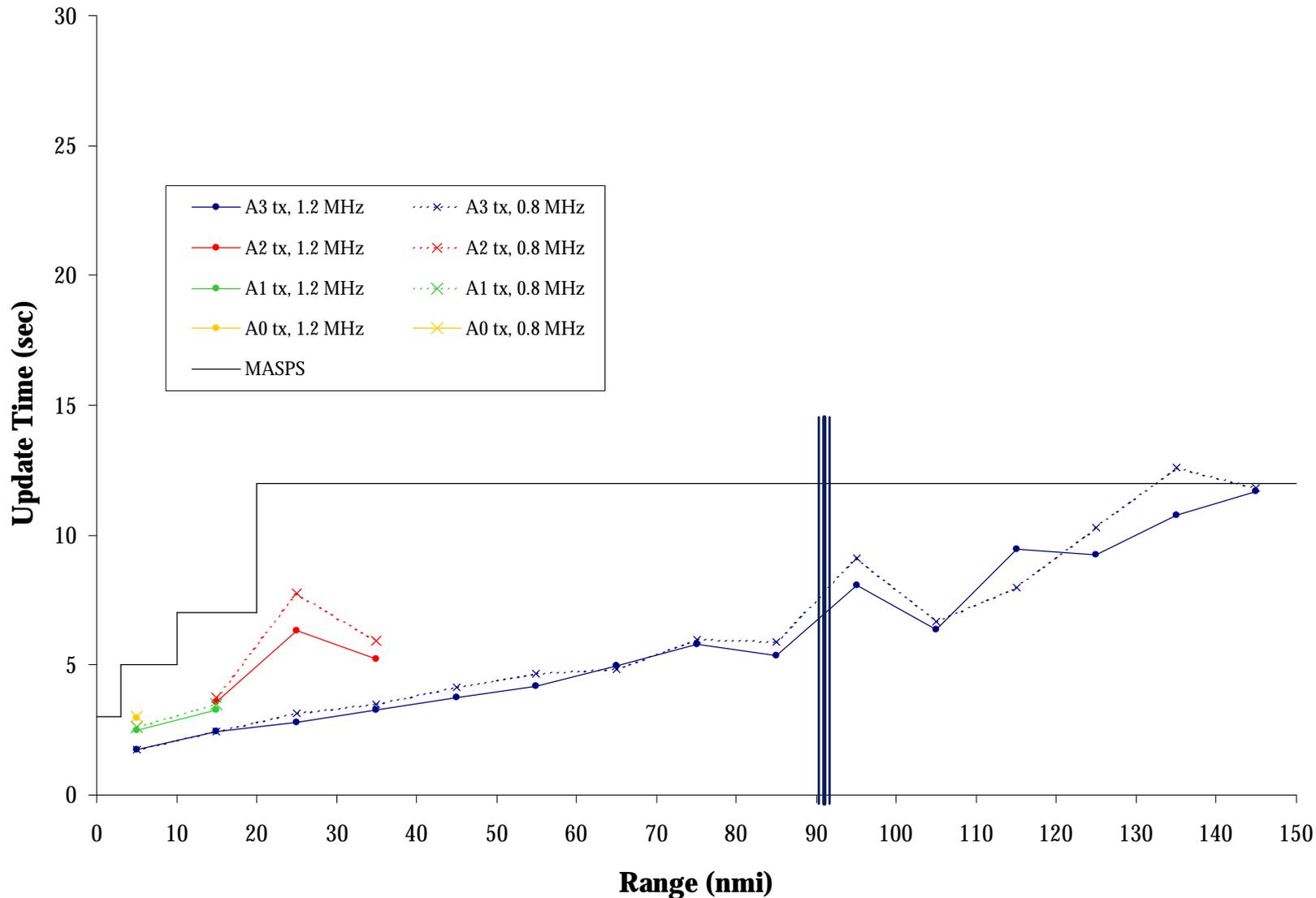
# State Vector Update Times for Diversity Receiver at High Altitude



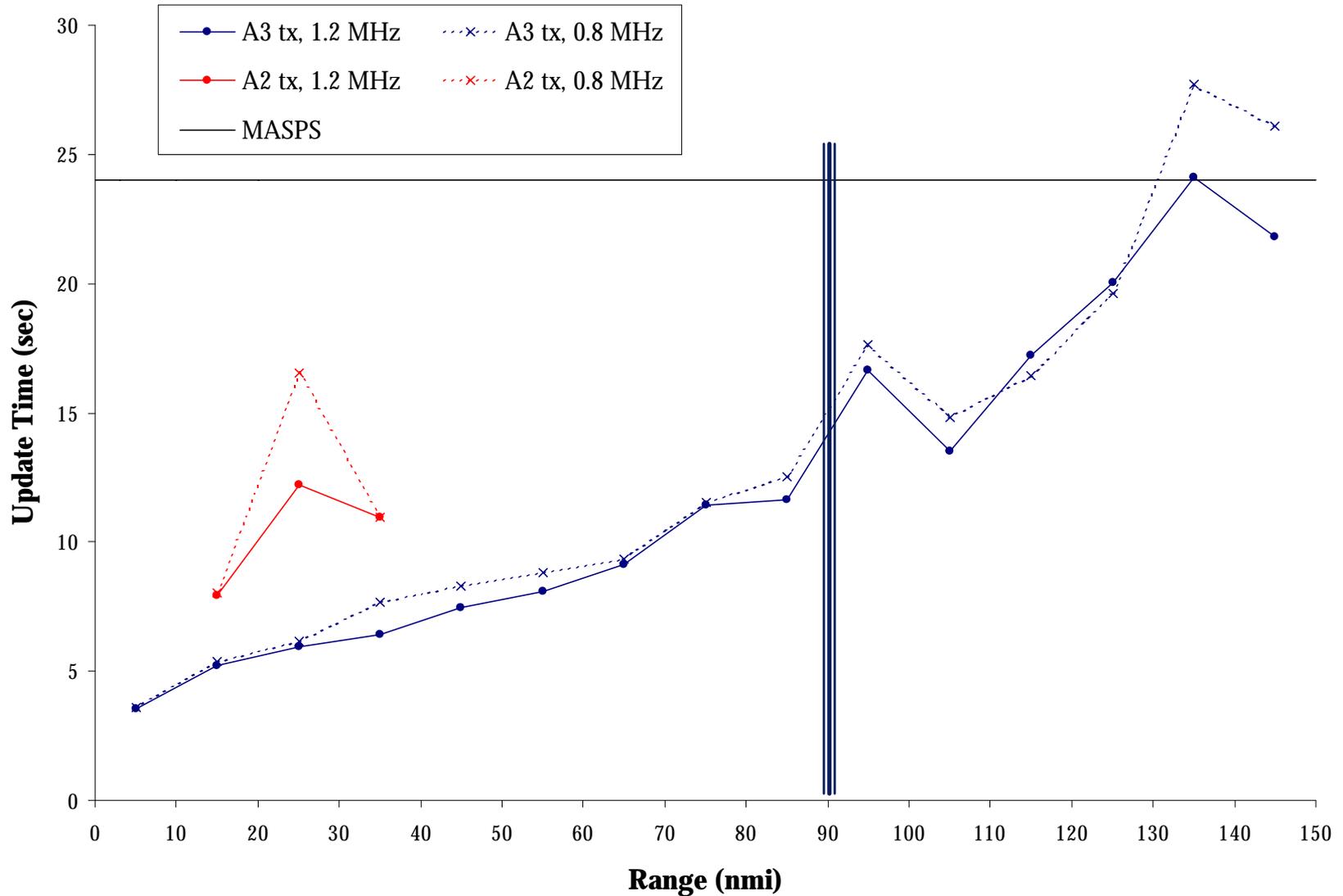
# TCP Update Times for Diversity Receiver at High Altitude



# State Vector Update Times for Diversity Receiver at FL 150



# TCP Update Times for Diversity Receiver at FL 150



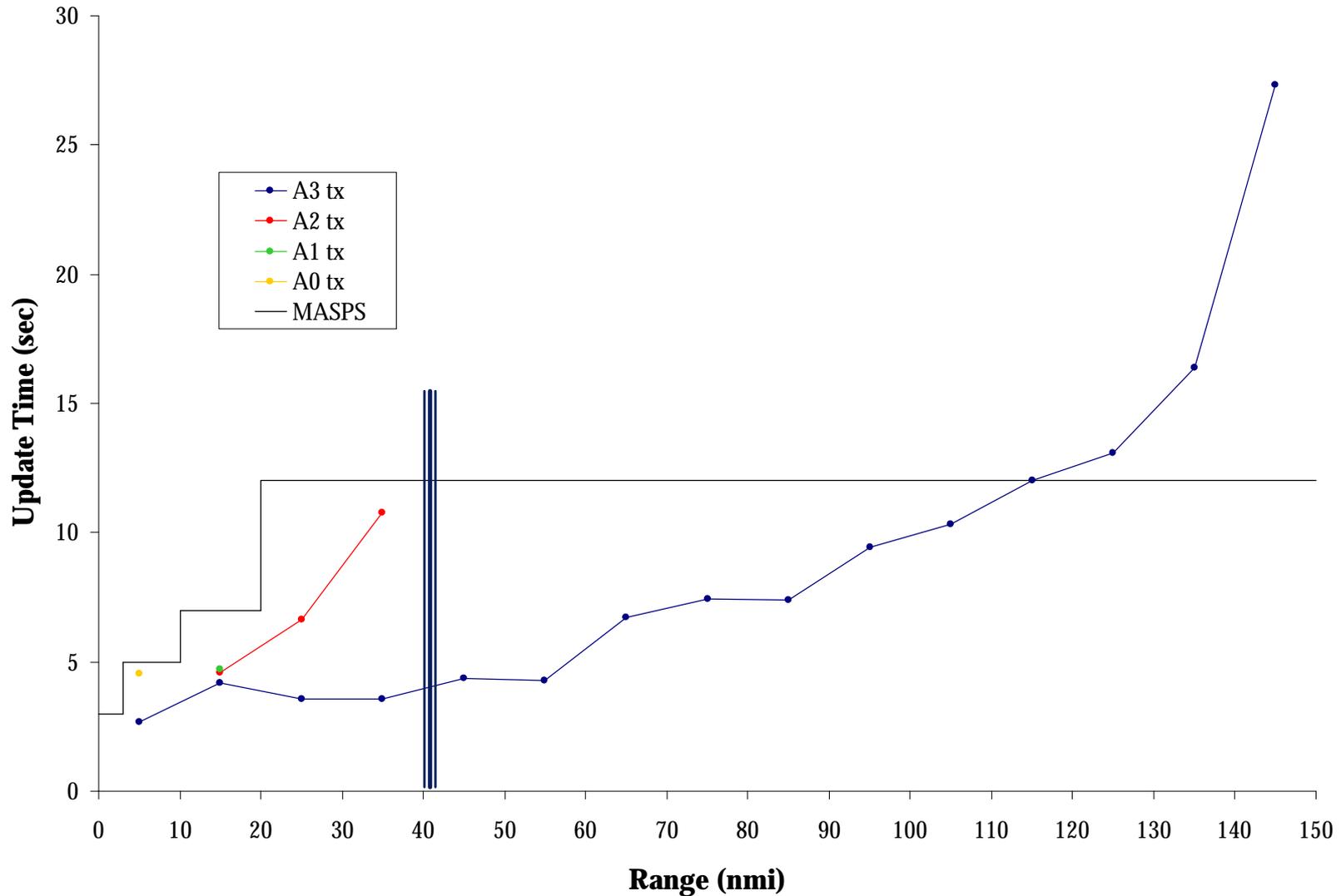
# Diversity Receiver Performance in LA 2020 Scenario

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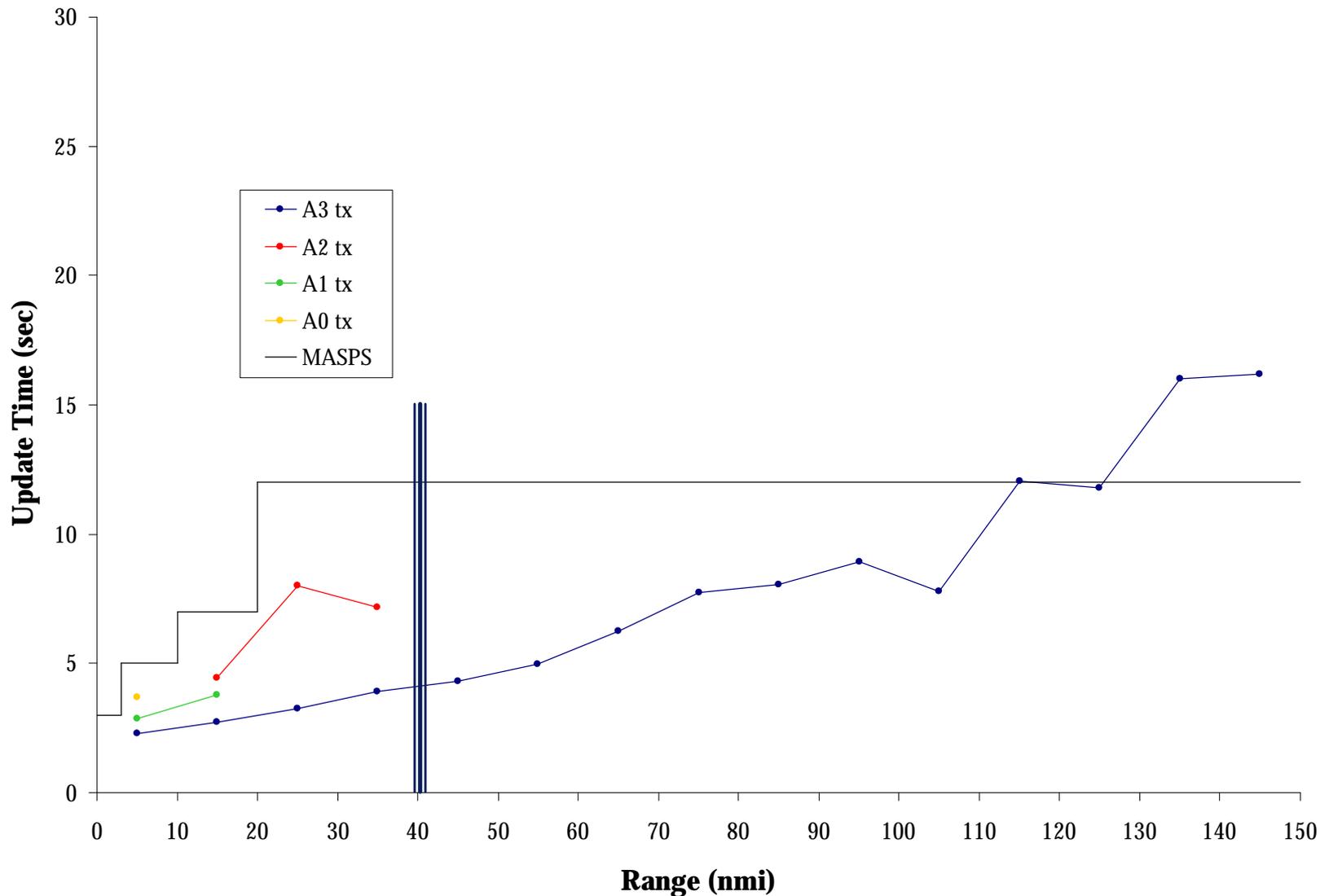
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- Both 0.8 and 1.2 MHz filters meet all current air-air ADS-B MASPS update requirements to past 90 nautical miles for both FL400 and FL150
- 1.2 MHz filter slightly outperforms 0.8
  - No DMEs
  - Small L16 effect

# State Vector Update Times for Switched Receiver at High Altitude



# State Vector Update Times for Switched Receiver at FL 150



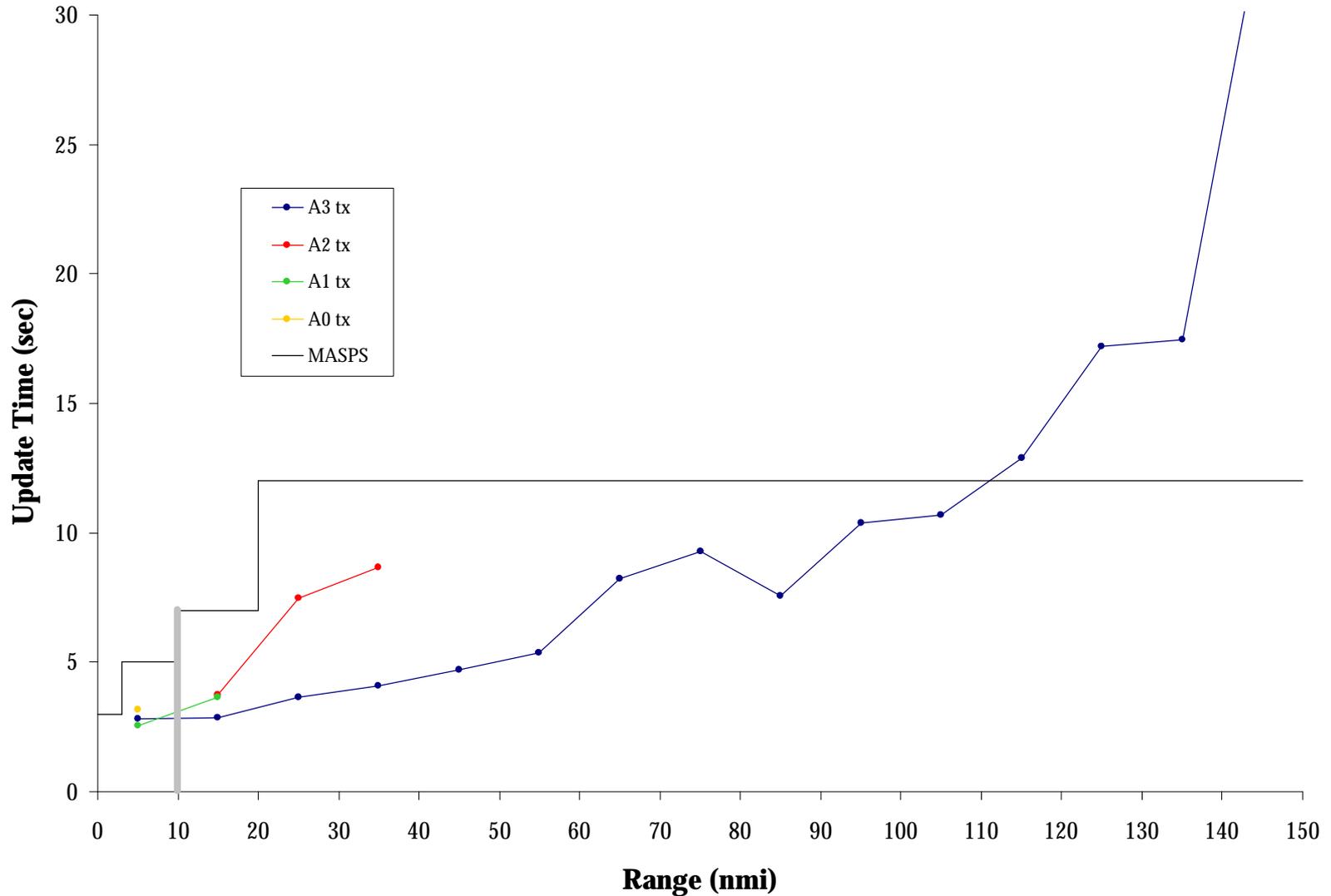
# Switched Receiver Performance in LA 2020 Scenario

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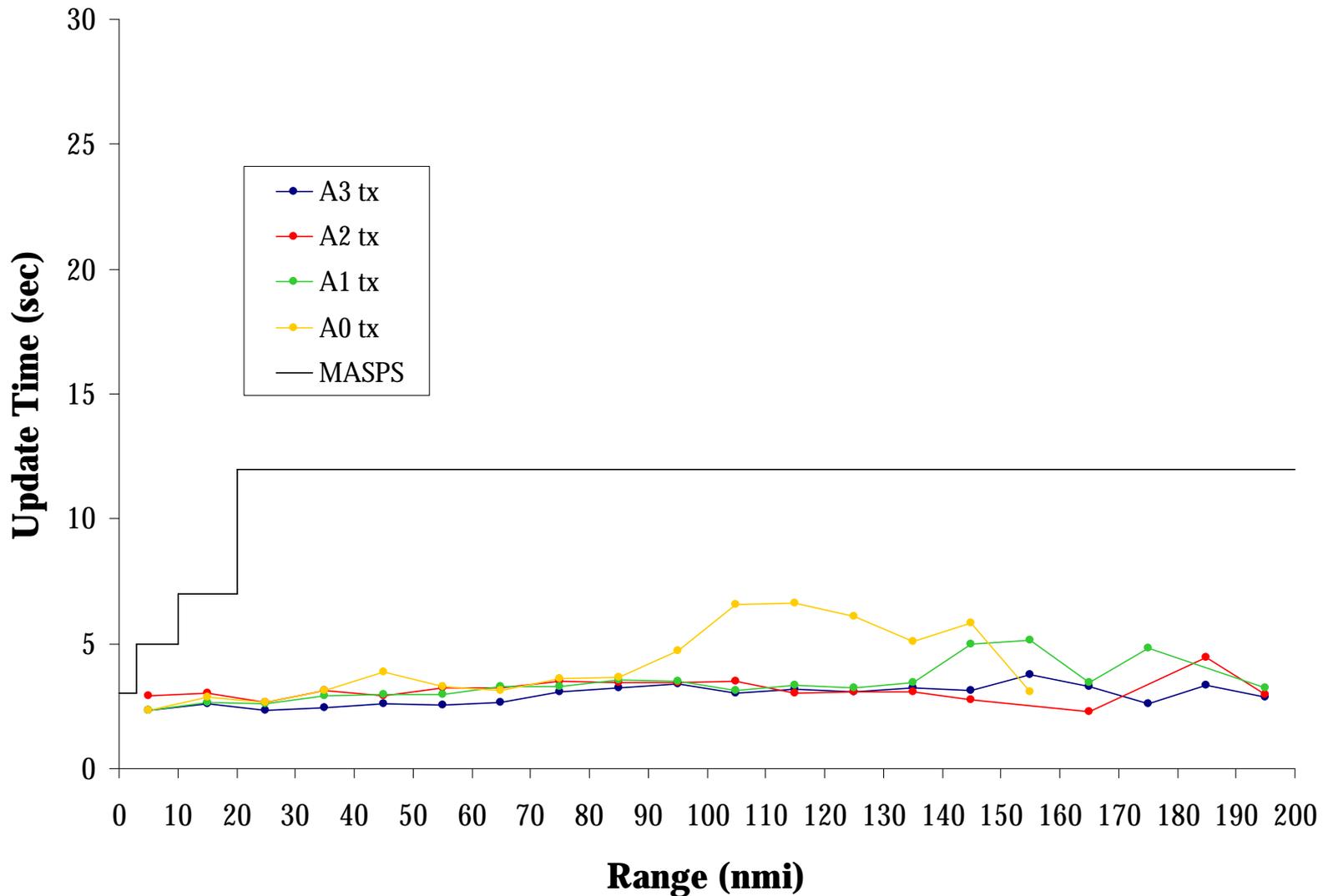
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- 1.2 MHz filter meets all current air-air ADS-B MASPS update requirements to past 90 nautical miles for both FL400 and FL150

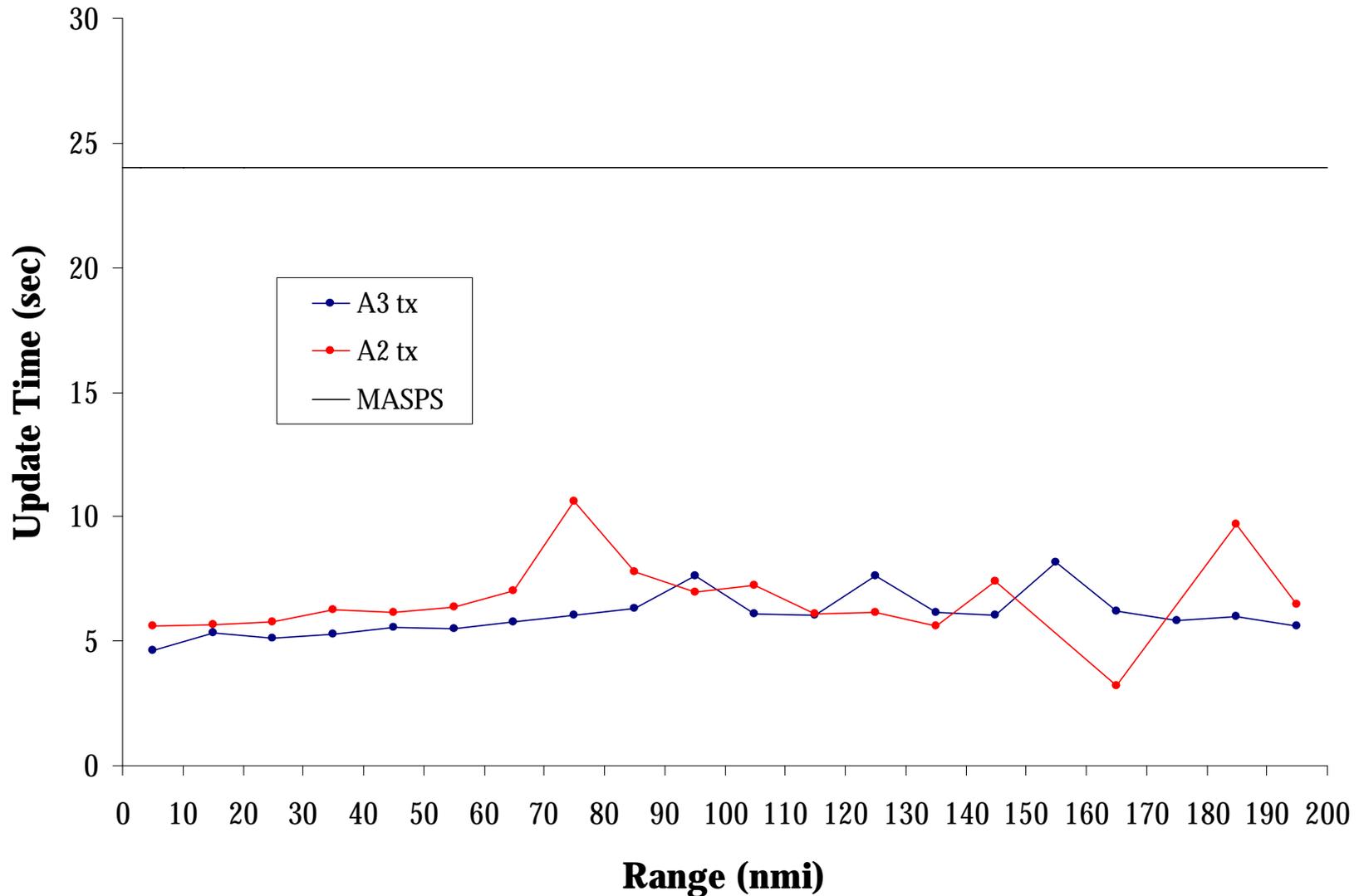
# State Vector Update Times for Bottom Only Receiver at FL150



# State Vector Update Rates for Ground Receiver With 1.2 MHz Filter



# TCP Update Rates for Ground Receiver With 1.2 MHz Filter



# Conclusions

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- System as configured meets all current air-air ADS-B MASPS update requirements to past 90 nautical miles
- Air-ground requirements met to past 150 nautical miles
- Lack of DMEs makes filter choice a tossup under L16 interference