



# All Things ADS-B

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# Why Listen to Me?



- It's too late to sleep in so stick around!
- Seattle Avionics has made aviation programs for 11 years (Voyager).
- Sell ChartData-brand aviation data to the major iPad vendors as well as Aspen, Dynon, and more.
- Make AOPA FlyQ EFB and Bendix-King myWingMan.
- Only company other than Jepp and Garmin to get FAA certification for our data.
- US and European data.

# What is ADS-B?

In addition to providing traffic and weather information, ADS-B improves FAA's ability to see and monitor aircraft. With a more precise understanding of the location of each aircraft, we'll be able to make better decisions.



making transportation convenient and dependable, while ensuring that flights are as safe, efficient, secure and hassle-free as possible.

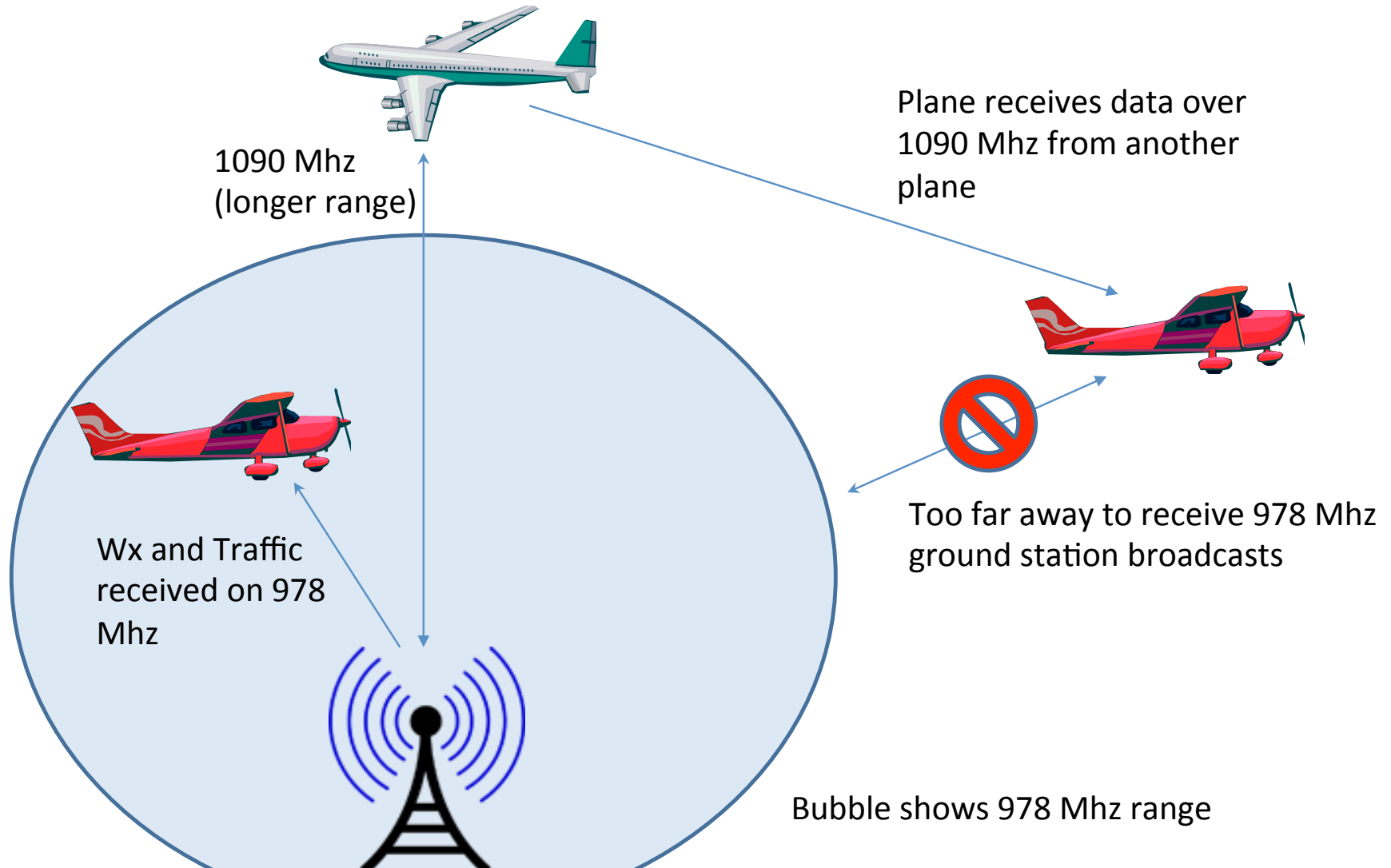


# Alphabet Soup



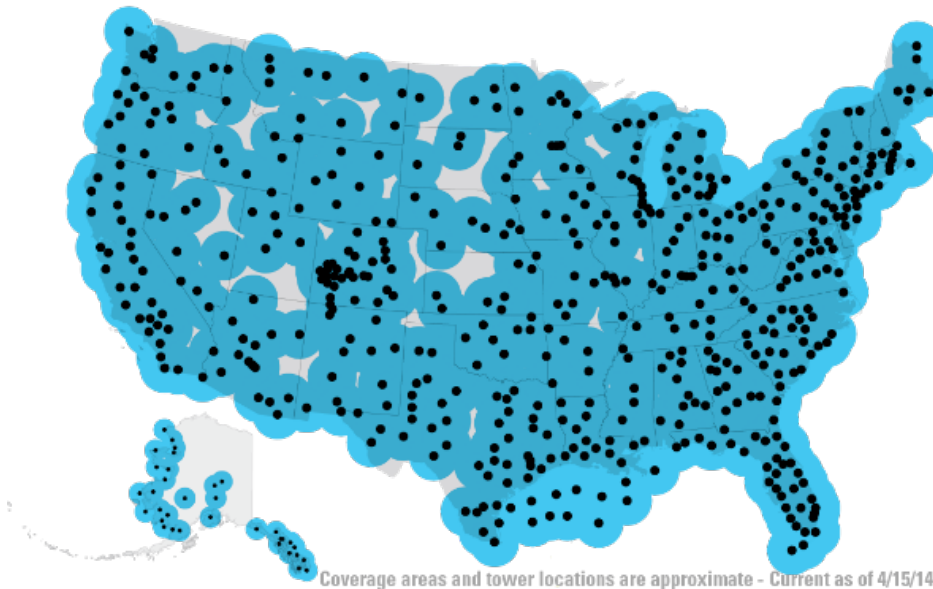
- TIS-B (Traffic Information Service - Broadcast)
- FIS-B (Flight Information Service - Broadcast)
  - Weather but not just weather
- 978, 1090 ES
  - 978 - Frequency used by most GA aircraft. Ground to aircraft. Traffic and weather.
  - 1090 - Frequency used by airliners. Aircraft to aircraft. Traffic only.
- In and Out
  - Not a hamburger place!
  - *In* means “receiver”, *Out* means “transmitter”
- ADS-B Out required by 2020. FAA doesn’t care about In.

# How Does it Work?



# Coverage

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- Coverage is very good but not perfect.
- Little or no ground reception. Inflight, line of sight only.
- Weather and traffic but traffic is problematic.
- Traffic is primary purpose.
- Weather limited but good enough. And free!

# Weather



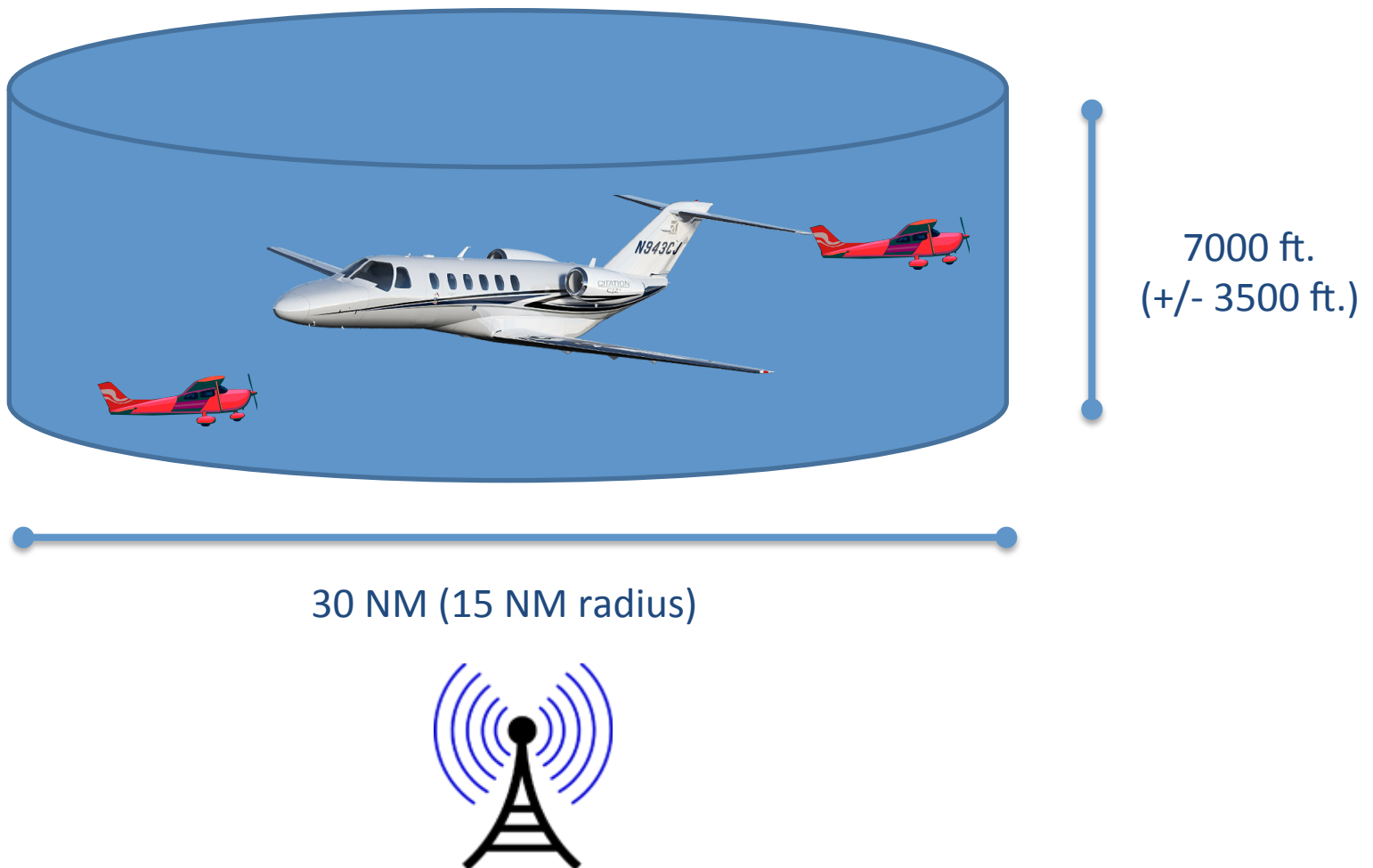
Product	Max coverage area (radius)	Best-case frequency
Regional NexRad Radar	250 NM	2.5 mins
US Nexrad	N/A	15 mins (usually less often)
METARs	100 NM	5 mins
TAFs	100 NM	10 mins
AIRMET/SIGMET	100 NM at airport surface / 500 NM inflight	5 mins
Winds/Temps	1000 NM	10 mins
TFRs and NOTAMs	100 NM	10 mins
PIREPs	500 NM	10 mins
SUAs	500 NM	10 mins

- Graphics are medium resolution. Not as good as XM.
- Don't confuse broadcast frequency with update frequency!
  - TAFs, Winds Aloft, AIRMET/SIGMET, etc.



# Traffic

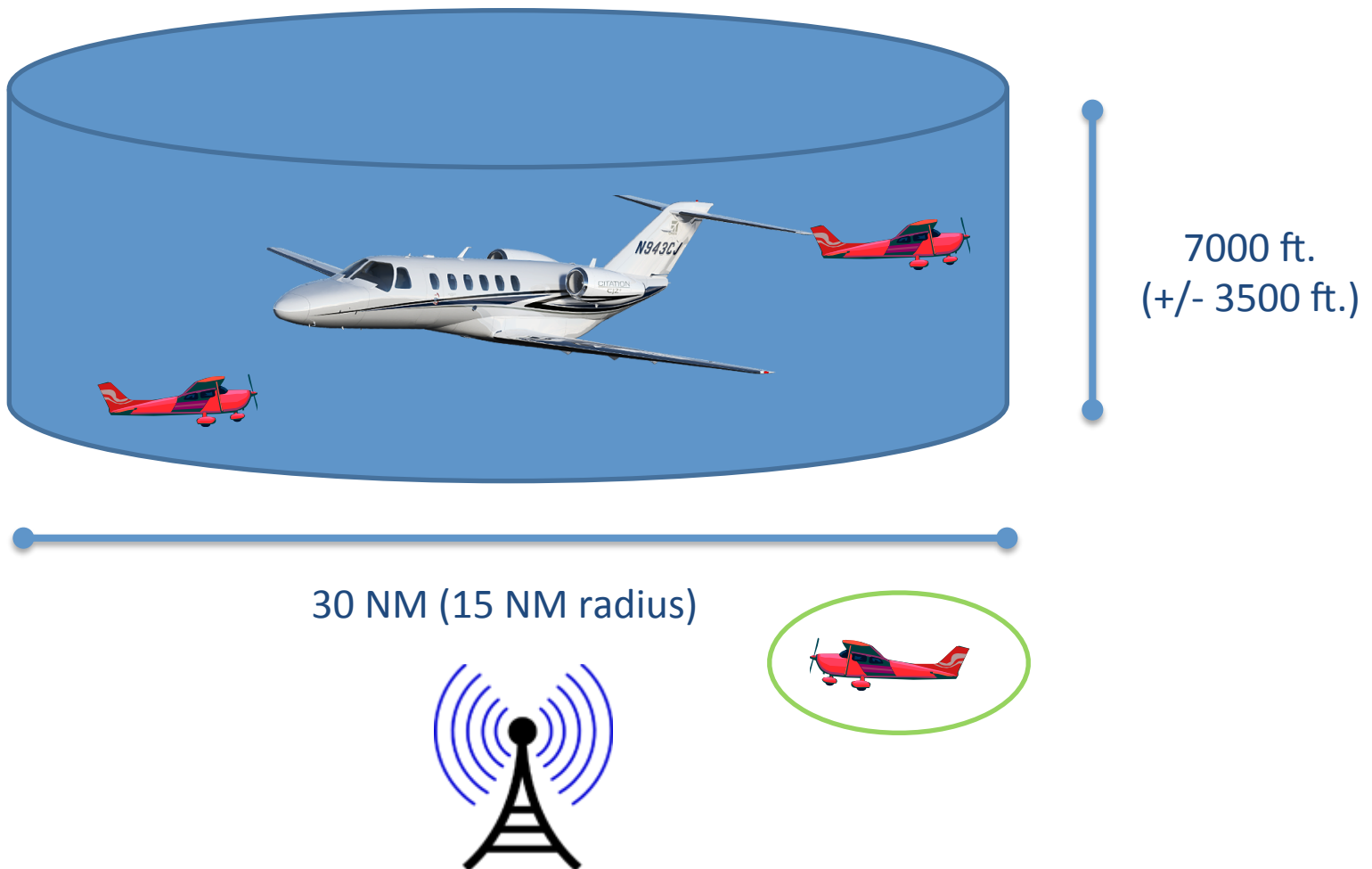
If you have ADS-B Out equipment, the ground station sends you all the targets in your area.





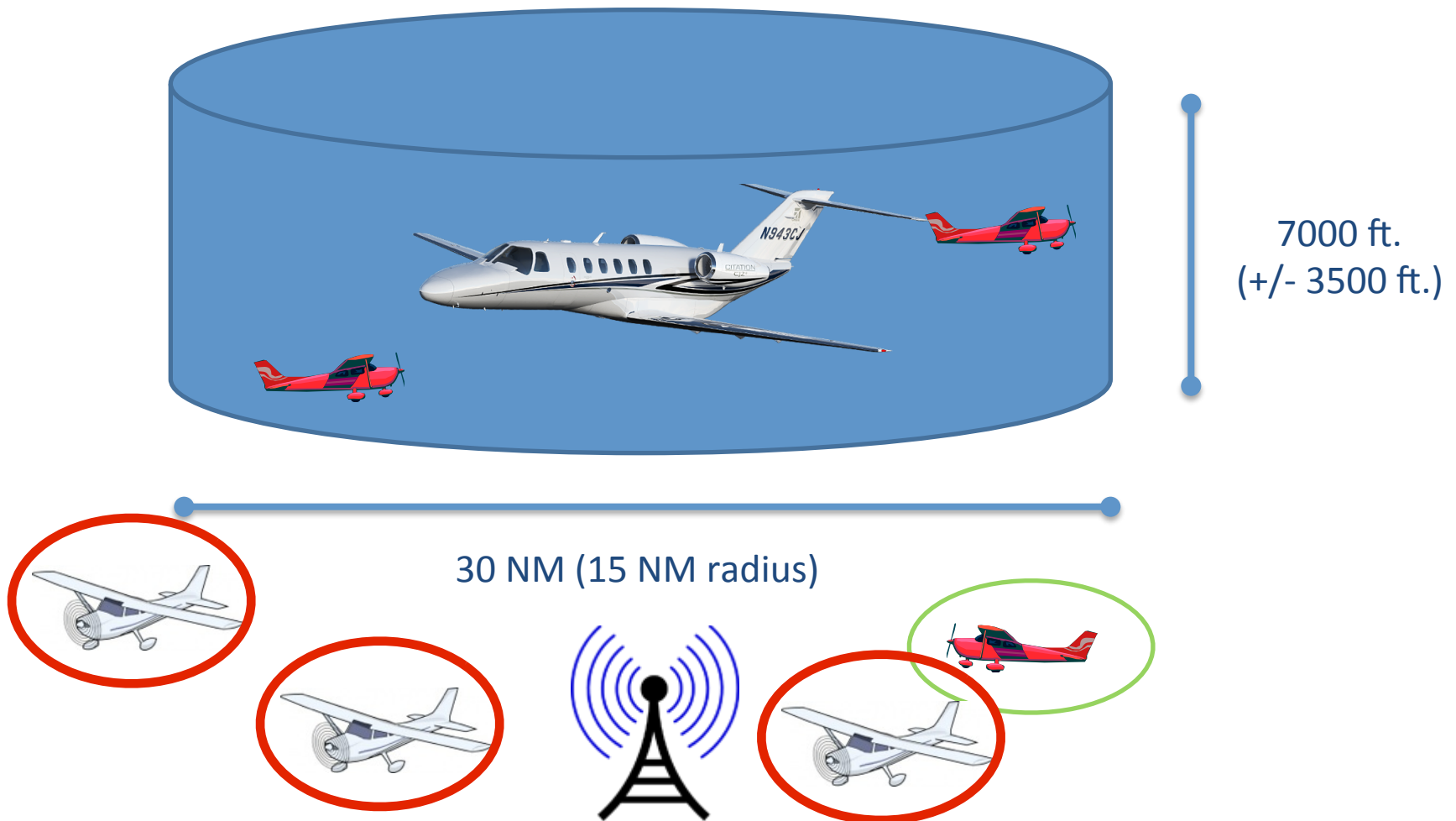
# Traffic

If you *don't* have ADS-B Out equipment but you *do* have ADS In, you can eavesdrop. But...



# Traffic

... you only see HIS targets, not yours. You'd miss all the planes circles in red.



# Traffic



No planes in the area, right?



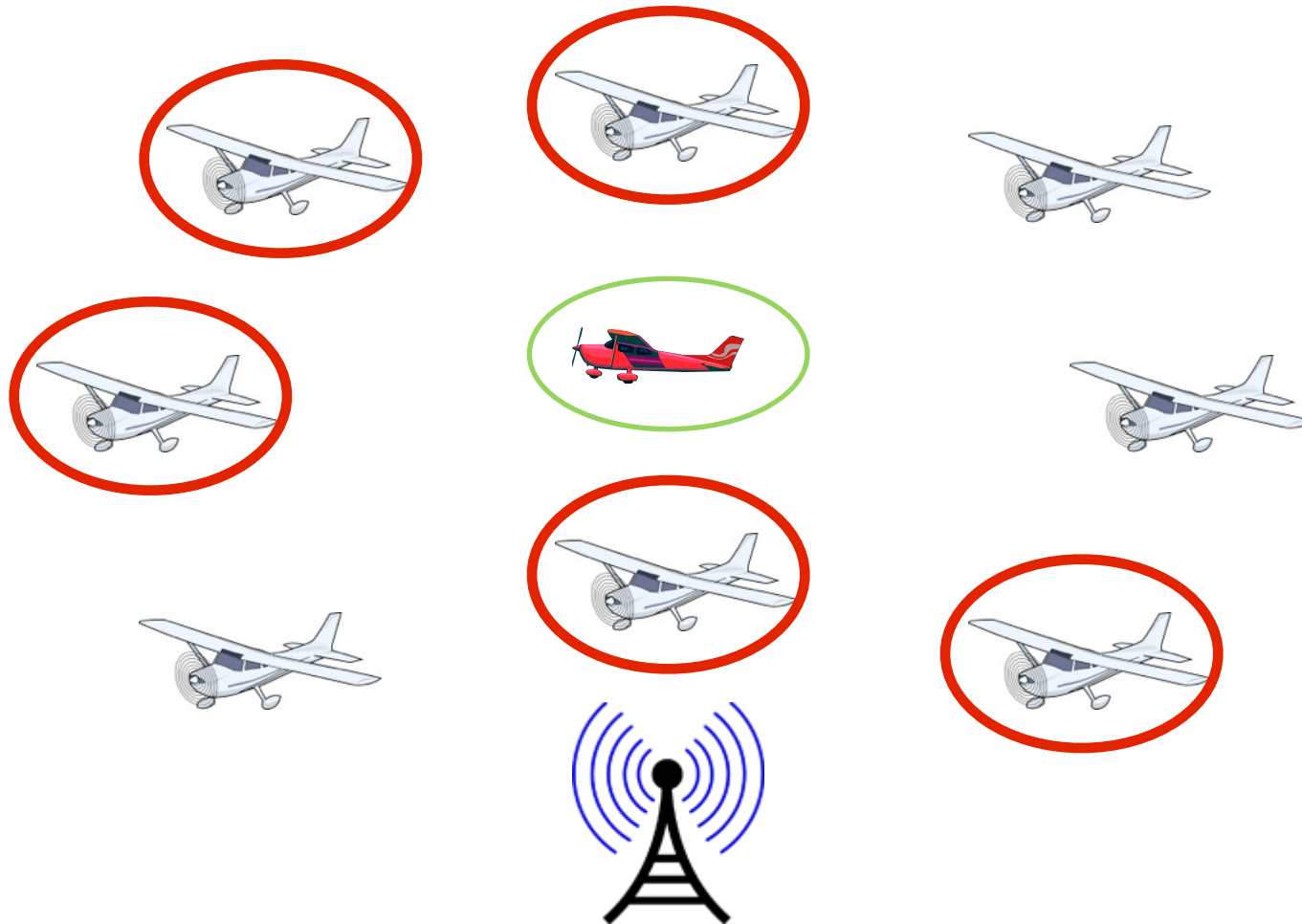
# Traffic



Nope! Lots of planes but none with ADS-B Out!

# Traffic

Bottom line: If you don't have ADS-B Out, you have no idea what the traffic is! All portable devices are ADS-B receivers only - no ADS Out.


















# Hardware

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# Hardware

Product	Apps	Single / Dual	AHRS	Battery	WiFi / Bluetooth	Price
Clarity	 	Dual	No	Yes	WiFi	\$1150
Clarity SV	 	Dual	Yes	Yes	WiFi	\$1400
Stratus (original)		Single	No	Yes	WiFi	\$599
Stratus 2		Dual	Yes but not ForeFlight	Yes	WiFi	\$899
Dual XGPS170	 	Single	No	Yes	Bluetooth	\$549
Garmin GDL 39		Dual	No / Yes	Yes	Bluetooth	\$699
iLevel SW	 	Single	Yes	Yes & Solar	WiFi	\$1095
SkyRadar - L	 	Single	No	No	WiFi	\$599 *
SkyRadar - DX	 	Dual	Yes	No	WiFi	\$849

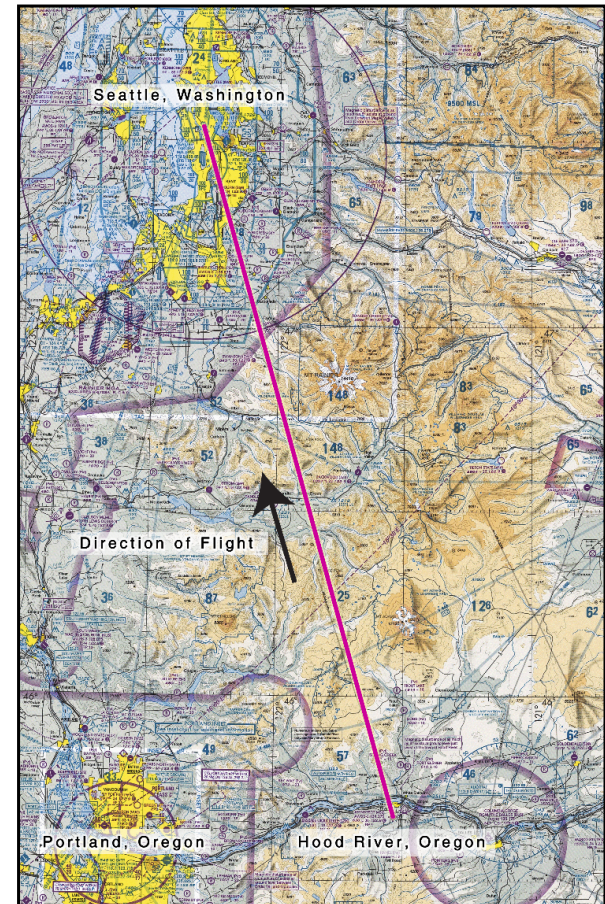
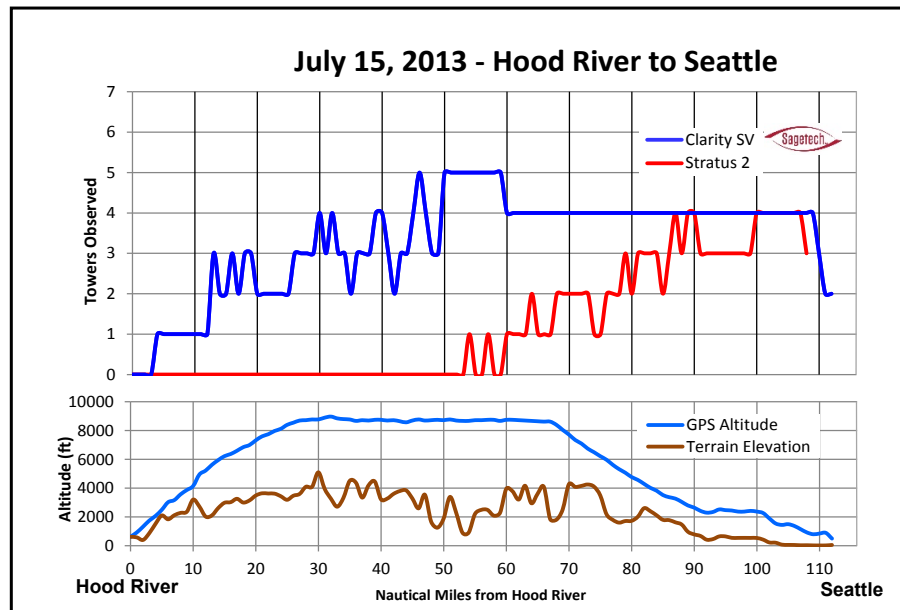
**No portable ADS-B device satisfies the 2020 FAA mandate because no portable device is allowed to transmit.**



# Hardware



## Clarity SV and Stratus 2 Reception Performance



- ▶ "Towers Observed" data collected from appropriate iPad EFB app
- ▶ GPS Altitude (on chart) differs from Barometric Altitude

Not all receivers are equal.

# Apps

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## ForeFlight

Good presentation. Only Stratus. Also XM.



## WingX

Most data, most receivers.



## AOPA FlyQ EFB

Clarity, Dual, iLevil, SkyRadar.



## Garmin Pilot

Only Garmin GDL 39. No AHRS. Also XM.

# Bottom Line

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- Not all receivers are equal.
- Avoid apps that only work with one device; avoid devices that only work with one app.
- Coverage is good but not perfect.
- Weather is OK but not great.
- No portable device satisfies the 2020 mandate because they cannot transmit.
- Traffic should not be relied upon unless you have a certified ADS-B Out system. But dual channel helps.

# Questions?

ADS-B Primer (PDF)

[http://seattleavionics.com/documents/ADS-B\\_Primer.pdf](http://seattleavionics.com/documents/ADS-B_Primer.pdf)

This presentation (Zip, PPT)

<http://seattleavionics.com/documents/AllThingsADSB.zip>