



Ligado Update

AFC June 2016 Meeting

Scope

- Current status
- FCC public notice and aviation filings
- Future work

Ligado Today



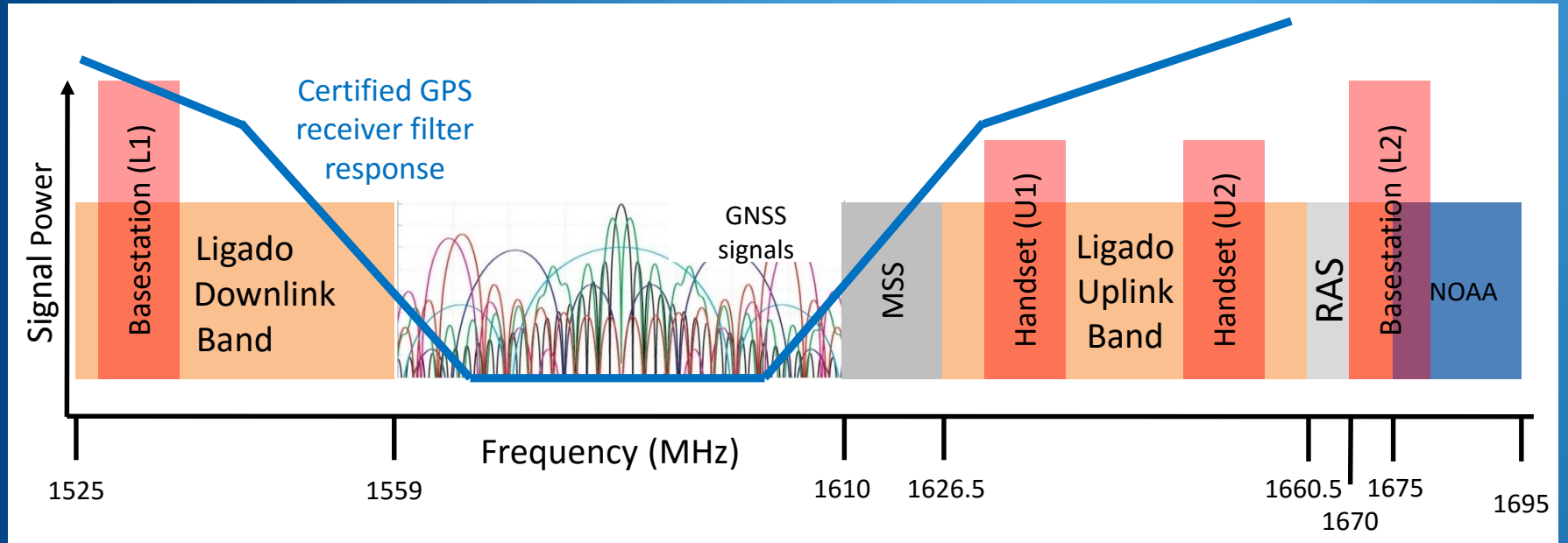
- Entered bankruptcy in 2012 with over \$1.7bn in debts
 - Recused by additional investors in 2015
 - Has rebranded as ‘Ligado Networks’
 - Over \$1bn in new financing for lobbying and engineering
- Sued GPS manufacturers and FCC over its GPS issues
 - Garmin, Deere, and Trimble settled in 2015
 - Dropped action against FCC
- Proposing ‘new’ arrangement in 2016
 - New approach to GPS industry
 - Similar spectrum plan as before (minor tweaks)
 - Proposing FAA make decision on compatible levels for certified aviation receivers
 - Conducting own testing of non-certified GPS devices outside of DoT plan
 - Pushing heavily for use of NOAA band

FCC Public Notice



- FCC issued two Public Notices on the 22 April 2016
 - Consideration of Ligado’s GPS proposals for a waiver
 - Possible licensing of the NOAA weather band
- From ASRI’s assessment of current information available, aviation potentially affected in four areas
 - Certified receivers
 - Non-certified receivers
 - AMS(R)S SATCOM
 - NOAA weather satellite interference

Spectrum Picture



Joint Aviation Filing

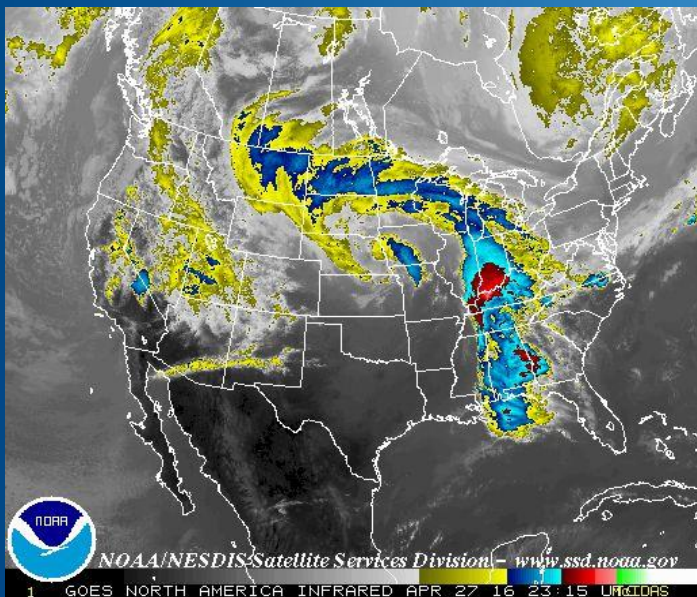


- ASRI and 11 other signatories filed against the Ligado GPS proposals with the FCC on the 23 May 2016
 - Noted that proposal was premature
 - Too many outstanding issues
- Certified receivers
 - Uncertain about how FAA may protect GPS devices
 - Risk of FCC modification/interpretation of FAA limitations
 - Same position as 2012
 - FAA conditions must be applicable to all Ligado emissions
- Non-certified receivers
 - Difficult to quantify impact on aviation
 - Ligado testing using own standards
 - Ignoring GPS industry supported testing by DoT
 - Must wait for DoT test plan to be completed

NOAA Weather Satellites



- Ligado's spectrum move impacts the NOAA datalinks
 - Weather balloons reporting links
 - Geostationary Operational Environmental Satellites (GOES)
- GOES system imagery is the primary source of:



- NWS Aviation Weather Center (AIRMET, SIGMET & PROG Charts)
- NWS Volcanic ash advisories
- NWS Hurricane Center advisories
- NWS Storm Prediction Center advisories
- Polar route radiation warning system
- Flood and storm surge warnings advisories
- Cloud-to-cloud and cloud-to-ground lightning data

- Only Ligado has conducted any technical analysis
 - Flaws in the analysis
 - Parameters used
 - Missing NOAA sites

Joint Aviation Filing



- SATCOM
 - Conflicting information about effect on Inmarsat systems
 - Iridium has not been studied yet
 - Ligado has referred back to SATCOM operators
- Additional comments files by:
 - A4A
 - AIA
 - Boeing
 - Garmin
 - Trimble

Looking Forward



- Public notice timelines
 - GPS comments period due to finish 6 and 16 June 2016
 - NOAA satellite initial comments due by 23 June
 - Will seek signatories in the same process as before
 - Possible webex briefing for those AFC members who are interested in more details
- FCC unlikely to rule on anything soon given current opposition
 - Will probably wait to see full outcome of comments and early DoT results
- ASRI will update the AFC as the issue develops
 - Additional support will be required