

FCC Part 101 Point to Point Microwave Rules – New and Proposed

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Overview

About Trango

- Leading Manufacturer of Wireless IP Backhaul Solutions
- Focused on Licensed/Unlicensed Bands 6-40 GHz
- Based in San Diego, California
- Delivering wireless solutions since 1996



Overview

- **Recent FCC activity in Licensed Bands - Highlights**
 - **New FCC Part 101 Rules were adopted Per FCC 11-120, dated August 9, 2011**
 - 6.8175 to 7.125 GHz **now available**
 - 12.7 to 13.150 GHz **now available**
 - Adaptive Modulation now allowed
 - Elimination of “Last Mile” rule for Broadcasters
 - **Proposed Rules – RM-11602 In comment phase**
 - Wider channels in 6 and 11 GHz bands
 - Smaller Antennas for 6, 18, 23 GHz
 - Relaxing Efficiency Standards in non-congested areas

New Rules

**New Rules that have been
adopted**

7 GHz Band

- **6.875 to 7.125 GHz Details**
 - **25 MHz max channel size**
 - 5, 8.33, and 12.5 MHz also available
 - **+55 dBw MAX EIRP (+85 dBM)**
 - **.005% frequency stability**
 - **Over 150 Mbps Full Duplex using 256 QAM Modulation**
 - **Min capacity of 89.4 Mbps with 50% loading required (25 MHz)**
 - **6 foot dishes just like 6 GHz band**
 - 2.2 degree 38 dBi Gain, F/B 55 dB (Cat A), 45 dB (Cat B)
 - **150 MHz Transmit/Receive Spacing**

Transmit (receive) (MHz)	Receive (transmit) (MHz)
6887.5	7037.5
6912.5	7062.5
6937.5	7087.5
6962.5	7112.5

13 GHz Band

- **12.7 to 13.15 GHz Details**
 - **50 MHz max channel size**
 - (5, 8.33, 12.5, and 25 MHz also available)
 - **4 paired 50 MHz channels available**
 - **300 + Mbps Full Duplex using 256 QAM modulation**
 - **Min capacity of 89.4 Mbps with 50% loading for 25 and 50 MHz**
 - Same as 11 GHz
 - **3-4 foot dishes possible depending on location**
 - 1 and 2 degree beamwidth max
 - **225 MHz Transmit/Receive Spacing**

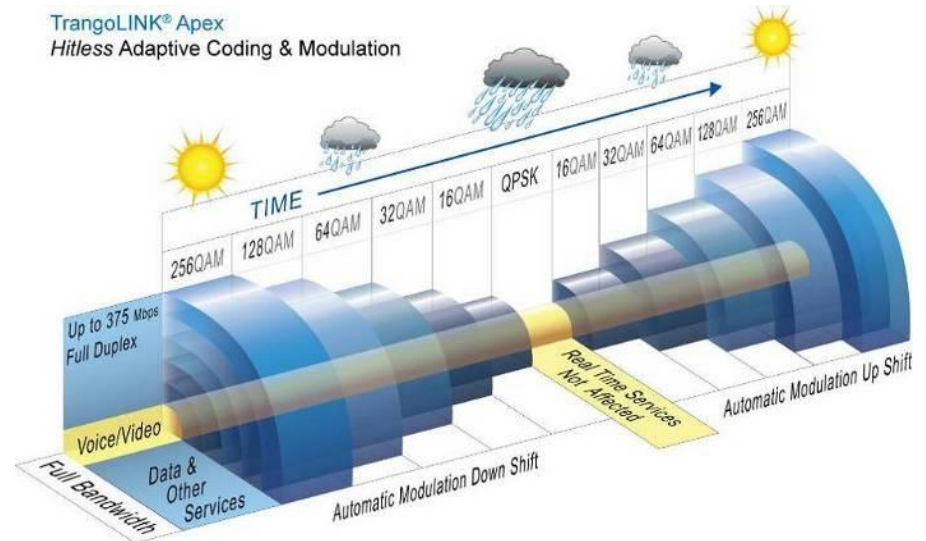
Transmit (receive) (MHz)	Receive (transmit) (MHz)
12725	12925
12775	12975
12825	13025
12875	13075

7/13 GHz Usage Restrictions

- **Bands are licensed currently for newsgathering/TV pickup under part 74 and 78 in most metro areas**
 - **Mobile Broadcast Auxilliary Service (BAS)**
 - **Cable TV Relay Service (CARS)**
- **Part 101 paths cannot cross TV pickup station service areas**
- **What is available**
 - **FCC estimates 54% to 64% of US land area can be licensed**
 - **Mostly rural areas**
 - **Covers 10% of the population**

Adaptive Modulation

- **ACM now officially allowed per Part 101.141**
 - Applies to 6, 7, 10, 11, and 13 GHz bands
 - Link must be engineered to 99.95% reliability
 - Use accepted multipath/rain fade models
 - Must meet the min capacity/loading requirements
 - **Rule allows:**
 - Lower modulations in signal fading conditions to maintain link
 - Non-compliance with min capacity/loading during the fading conditions



Final Link or Last Mile Rule

- **Eliminate the “Final Link” Rule for Broadcasters**
 - **Previously Broadcasters could not use Part 101 for last mile transmission to broadcast stations**
 - **Broadcasters can now use Fixed Part 101 Spectrum**

New Rules

Proposed Rules in the Comment phase

Proposed Rules

- **Wider Channel Bandwidths**
 - **60 MHz in the 5.925 to 6.425 (lower 6) GHz Band**
 - 400 + Mbps
 - **80 MHz in the 10.7 to 11.7 GHz Band**
 - 500 + Mbps
- **Smaller Directional antennas allowed for areas not subject to frequency congestion (Cat “B2”)**
 - **6 GHz - As low as 3 foot diam(32 dBi)**
 - 60 dB F/B ratio
 - **18 GHz – As small as 1 foot diam (33.5 dBi)**
 - 3.3 degree BW, 59 dBi F/B
 - **23 GHz – As small as 8 inch diam (30.5 dBi)**
 - 3.3 degree BW, 52 dBi F/B

Proposed Rules, cont'd

- **Exempt microwave stations in non-congested areas from the min capacity and loading requirements IF:**
 - The capacity requirement will prevent deployment for economic or technical reasons
 - There is no reasonable alternative
 - It benefits tangible and specific public interests
- **Revise waiver criteria under which microwave stations aimed toward geostationary satellites.**
- **Redefine “capacity” and loading to reflect IP type traffic Part 101.3**
 - **“Payload Capacity.** The bit rate available for transmission of data over a radiocommunication system, excluding overhead data generated by the system”

Summary

- **New 7 and 13 GHz Bands will make it easier to reach rural areas with high capacity licensed links**
 - Manufacturers like Trango have added or will be adding new equipment soon to support the new bands
- **ACM rules will allow longer paths, reducing costs of midspan relay points or larger antennas**
- **Final Link Rule should stimulate activity in the Broadcast market**
- **The Proposed rules may have even more impact**
 - Higher link capacities for long haul links
 - Smaller footprints for radios on buildings and towers will improve aesthetics
 - More opportunity for the 6 and 11 GHz bands in underserved areas due to removal of min capacity

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Thank You!

