

4.9 GHz Public Safety Band Rules and Licensing Overview

Updated September 2009

Eligibility

The FCC assigned the frequency band 4940 to 4990 MHz for Public Safety use. Specific eligibility is defined in FCC rule 90.523 and includes all state and local government agencies. Private companies supporting public safety agencies such as private ambulance services and companies with critical infrastructure can negotiate sharing agreements with sponsoring government agencies. Such sharing agreements limit use of the band by private companies to protection of life, health and property. No commercial use of the band is allowed.

Approved Uses The band may be used for any terrestrial based radio transmission including data, voice, and video. Both point-to-point and point-to-multipoint operations are permitted. Usage may be temporary or permanent and both mobile and fixed applications are acceptable. Commercial use is prohibited and aeronautical use such as helicopter-to-ground video requires an FCC waiver. Primary uses of the band include multipoint links and temporary point-to-point links. Temporary in this case is defined as in service for less than 1 year. Permanent point-to-point links are secondary uses. Normally interference can be eliminated by technical or operational modifications to the affected networks. In cases where interference cannot be eliminated by these means, primary users take precedence over secondary users.

License Search Existing 4.9 GHz licenses may be found by performing a search of the FCC database. This can be accomplished by accessing the following website:

<http://wireless2.fcc.gov/UlsApp/UlsSearch/searchLicense.jsp>

From this website, select “Advanced License Search”. On the resulting page, enter search criteria as desired. Under “Frequencies” enter Range 4940 to 4990 to see all 4.9 GHz licenses issued per criteria entered.

Application Note

4.9 GHz Band Channel Plan

The 4.9 GHz band is divided into 18 channels with the following center frequencies:

Channel Number	Center Frequency (MHz)	Channel Bandwidth (MHz)
1	4940.5	1
2	4941.5	1
3	4942.5	1
4	4943.5	1
5	4944.5	1
6	4947.5	5
7	4952.5	5
8	4957.5	5
9	4962.5	5
10	4967.5	5
11	4972.5	5
12	4977.5	5
13	4982.5	5
14	4985.5	1
15	4986.5	1
16	4987.5	1
17	4988.5	1
18	4989.5	1

Channels may be banded together to form 5, 10, 15 or 20 MHz channels for increased data throughput rates and increased output power.

Power Limits

Peak transmitter output must not exceed the following levels:

Channel RF Bandwidth (MHz)	Peak Transmitter Power (dBm)
1	20
5	27
10	30
20	33

Application Note

Omnidirectional antenna gain is limited to 9 dBi at full transmit power. In most cases directional antenna gain is limited to 26 dBi at full transmit power. Antenna gains may exceed these limits if the radio transmit power is reduced dB for dB that the antenna gain exceeds the limit.

Channel Bandwidth	FCC EIRP Limits High power mask
5	53 dBm
10	56 dBm
20	59 dBm

EIRP limits are a sum of peak transmitter power and directional antenna gain minus rf cable losses. For example, at 4.9 GHz, with 5 MHz bandwidth, using a 4 foot parabolic with a gain of 32.6 dB added to the transmitter output set at +23dBm with rf cable with a loss of 2.4dB = 26 + 32.6 – 2.4 – thus equaling 53dBm.

Frequency Coordination

Any public safety agency obtaining a 4.9 GHz license may use any part of the 4940-4990 frequency band within the geographic area served by the agency. No frequency coordination is required prior to licensing. Since multiple agencies may receive licenses for the same geographic area, interference is possible. Interference normally can be prevented or eliminated by agencies working together on a technical solution. Point-to-Point links, when designed well and implemented with good directional antennas should be resistant to interference.

Some of the 700 MHz Regional Planning Committees have submitted plans to the FCC covering 4.9 GHz band usage. These RPCs will generally keep a database of 4.9 GHz licensees and operations within the region. The database can be used as a reference in new system channel selection so that chance of interference is minimized. The RPCs may also be willing to act as mediators when interference exists.

In cases where 4.9 GHz licensees will be operating near the Canadian boarder, the FCC may require frequency coordination with the Canadian government.

Adjacent Frequency Band Considerations

The U.S. Navy conducts Cooperative Engagement Capability (CEC) operations in nine geographic training areas using the frequency band immediately below the 4.9 GHz band. The nine areas are defined in Appendix C of the FCC's 4.9 GHz Third Report and Order, Docket 00-32, released May 2, 2003. The potentially high transmitter power used by the Navy may interfere with the lower portion of the 4.9 GHz band in areas along the East, West and Gulf Coasts and State of Hawaii.

Application Note

Radio Astronomy uses the 4990-5000 MHz band in certain locations in the U.S. 4.9 GHz licensees must not interfere with radio astronomy sites. Since most public safety transmitters operate close to the ground, the chance of interference with radio astronomy observatories should be minimal.

Licensing

Eligible agencies can apply for a 4.9 GHz license using the FCC's Universal Licensing System (ULS) available on the FCC website. There is no cost to obtain a license in this manner.

Information required for form 601 from Carlson Wireless is listed in the charts below:

Trailblazer: FCC Identifier OPA-TB49

FCC Rules Parts	Frequency Range (MHz)	Output dBm	Channel Size	Emission Designator
90	4950.0 – 4980.0	18	16 MHz	16M6D7D

LongHaul: FCC Identifier OPA-WIBRID-108

Grant Notes	FCC Rules Parts	Frequency Range (MHz)	Output dBm	Channel Size	Emission Designator
CC	90	4950.0 – 4980.0	26	20 MHz	19M2G7D
CC	90	4945.0 – 4985.0	25	10 MHz	8M70G7D
CC	90	4942.5 – 4987.5	23	5 MHz	4M23G7D

The following is a summary of steps involved in obtaining a license.

1. Start at <http://wireless.fcc.gov/uls/>, select "On-Line Filing".
2. Enter the agency's FCC Registration Number (FRN) and password and hit "submit". In most cases an agency will already have an FRN, but if not, an FRN may be obtained from this website.
3. On the next screen, select "Apply for New License" located on the left side of page.
4. After the screen "License Manager" appears, under the "Select Service" drop-down box, select radio service code "PA" and then hit "Continue".
5. Form 601 will be the next screen. Fields not required appear faint on the page. When appropriate, answer "No" to "Will this application require a waiver of the Commissions rules?" and "Are attachments filed with this application?". Answer other questions appropriately. Select "Next Page" when done.
6. Under the box labeled "The licensee is", select "Governmental Entity". Complete all other blank fields. Select "Next Page" when done.
7. Answer all questions on the "Ownership Questions/Qualifications" page using the drop-down boxes. Select "Next Page" when done.

Application Note

8. On the “General Certification Statements” page enter the name of the person authorized to sign the application in the box provided. Select “Next Page” when done.
9. On the “Control Point” page, select “add a control point” and enter the requested information. Select “Save” and then “Next Page”.

10. On the “Administrative” page, under “Eligibility” and “Rule Section”, enter “90.1203. Enter description of agency’s activity in box provided. Select “Next Page” when completed.
11. On the “Location” page, select “Add”. Answer remaining questions appropriately. Note that different inputs under “Location Description” require different information to be entered on the application. Select “Next Page” when done.
12. On the “Antenna” page, input is only required if the license is for a permanent fixed point-to-point link. Answer appropriately and select “Next Page” when done.
13. On the “Frequency” page, input is only required if the license is for a permanent fixed point-to-point link. Enter frequency values for each location. When completed, select “Submit” to file the application with the FCC.
14. Licenses are normally granted within one or two days. Licenses are valid for 10 years.