WWARA BAND PLANS

NOTE: This document has exactly the same content as the "***Western Washington Amateur Relay Association Coordination Policies***" (Adopted June 3, 2004) but is easier to read. It was written as a reference for any amateur who wants an accurate band plan without having to dig it out of our coordination policies. If a discrepancy between the two documents is identified, the Coordination Policies document is the official source.

Spectrum Use Considerations

6 Meter Band Plan

50.000 - 50.100	CW Only
50.060 - 50.080	Beacon Sub-band
50.100 - 50.300	SSB, CW
50.100 - 50.125	DX Window
50.125	SSB Calling
50.300 - 50.600	All Modes
50.600 - 50.800	Digital Non-Voice Communications[1]
50.620	Packet Calling Frequency
50.800 - 51.800	Radio Control[1]
51.000 - 51.100	SSB Pacific DX Window
51.100 - 52.290	FM Repeater inputs[1 2 3 4]
52.310 - 52.550	FM Non-Data, Voice Only, Simplex[1 5]
52.525	National Simplex Frequency[5]
52.570	FM cross-band linking frequency
52.590 - 52.790	Data, Non-Voice, Simplex[1]
52.810 - 53.990	FM Repeater Outputs[1 3 4 6]

Notes:
[1] 20kHz channel spacing
[2] Paired with repeater inputs +1.7MHz
[3] WWARA coordination recommended
[4] 52.19/52.99 Shared Non-Protected (SNP) repeater pair
[5] 52.51, 52.53 not used to protect national simplex frequency
[6] Paired with repeater inputs -1.7MHz

2 Meter Band Plan

144.000 - 144.050	EME (CW)
144.050 - 144.100	General CW and weak signals
144.100 - 144.200	EME and weak signal SSB
144.200 - 144.275	General SSB operation
144.275 - 144.300	Propagation Beacons
144.300 - 144.500	New OSCAR subband
144.500 - 144.600	FM Repeater/Linear Translator inputs[1 2 3 4]
144.600 - 144.900	FM Repeater inputs[1 2 3 4]
144.900 - 145.100	Digital Communications
145.100 - 145.200	FM Repeater/Linear Translator outputs[1 2 3 4]
145.200 - 145.500	FM Repeater outputs[1]
145.500 - 145.800	Miscellaneous and experimental modes
145.800 - 146.000	OSCAR Sub band
146.010 - 146.410	Repeater inputs[1 2 3]
146.420 - 146.580	Simplex
146.520	National Simplex Frequency
146.600	FM cross-band linking frequency

146.610 - 147.390	Repeater outputs[1 2 3]
147.420 - 147.600	Simplex
147.610 - 147.990	Repeater inputs[1 2 3]

Notes:
[1] WWARA coordination recommended
[2] Washington, the adjoining States and BC use 20 kHz spacing between repeater channels
[3] Repeater channels are on odd frequencies below 146 MHz and even frequencies above 146 MHz
[4] 144.53/145.13 and 144.69/145.29 Shared Non-Protected (SNP) repeater pair

1.25m MHz Band Plan

222.000 - 222.025	EME
222.025 - 222.099	CW
222.100	National SSB Calling Frequency
222.101 - 222.154	SSB
222.155 - 222.170	Beacons
222.171 - 222.175	Guard Band
222.180 - 222.380	Repeater Inputs[1 2]
222.400	Shared Non-Protected (SNP) # 1 Input[1]
222.420 - 223.020	Repeater Inputs:[1 2]
223.035 - 223.065	ACSSB Inputs[1]
223.080 - 223.220	Repeater Inputs[1 2]
223.240	Shared Non-Protected (SNP) # 2 Input[1]
223.260 - 223.380	Repeater Inputs[1 2]
223.400 - 223.480	FM Simplex/FM Packet[2]
223.500	National FM Calling Frequency
223.520 - 223.540	Point-to-Point Control[1]
223.560 - 223.660	100 kHz Hi Speed Data Channel # 1
223.660 - 223.760	100 kHz Hi Speed Data Channel # 2
223.780 - 223.980	Repeater Outputs[1 2]
224.000	Shared Non-Protected (SNP) # 1 Output[1]
224.090	Cross Band Repeater Freq.
224.020 - 224.620	Repeater Outputs[1 2]
224.635 - 224.665	ACSSB Repeater Outputs[1]
224.680 - 224.820	Repeater Outputs[1 2]
224.840	Shared Non-Protected (SNP) # 2 Output[1]
224.860 - 224.980	Repeater Outputs[1 2]
224.995 - 225.000	Guard Band

Notes:
[1] WWARA Coordination recommended
[2] All FM Repeaters and simplex operations are on 20 kHz spacing

70cm Band Plan

420.000 - 426.000	ATV repeater, control links and experimental operation[1 2 4]
421.250	Video carrier for ATV[3]
426.000 - 432.000	ATV simplex, control links special mode and experimental operation[1 2]
427.250	Video carrier for ATV[3]
430.800 - 431.000	Packet radio
432.000 - 433.000	Weak signal activities - NO FM ALLOWED
432.100	National SSB calling
433.000 - 435.000	ATV repeater, auxiliary links and repeater links[1]
434.000	Video carrier for ATV[3]
435.000 - 438.000	Satellite only by international treaty
438.000 - 440.000	Control links, special modes and experimental operation[1 4 8]
439.800 - 439.975	Packet Radio[8]

440.000 - 445.000	Repeater outputs, links and simplex[1 5 8]
440.000	Shared Non-Protected Pair (SNP) #1 output
440.025	Cross band operation[6]
440.700 - 440.775	Packet repeater outputs[8]
440.800 - 440.900	Packet simplex[8]
441.000	National Packet simplex frequency
443.000	Shared Non-Protected Pair (SNP) #2 output
445.000 - 450.000	Repeater inputs, links and simplex[1 8]
445.000	Shared Non-Protected Pair (SNP) #1 input
445.700 - 445.775	Packet repeater inputs[8]
445.800 - 445.900	Voice simplex only[7 8]
445.825	Shared Public Service simplex. Other frequencies will be added for this use as they become available
445.975 - 446.025	Voice simplex only[7 8]
446.000	National FM simplex calling
448.000	Shared Non-Protected Pair (SNP) #2 input

Notes:
[1] WWARA Coordination recommended
[2] 420 MHz to 430 MHz cannot be used north of line A
[3] WWARA will assist with technical ATV requirements only and because there is only one channel per segment, the WWARA will not coordinate their exclusive use
[4] Some control links are coordinated in this band
[5] Segments designated simplex do not require coordination
[6] This frequency can be used without coordination recommendation for temporary cross band operation from designated frequencies in other bands. High power, big antenna arrays and permanent operations are NOT RECOMMENDED. This frequency is afforded no protection.
[7] There is some existing activity coordinated within these segments. Efforts are being made to clear the whole 445.800 through 446.000 MHz segment for exclusive voice simplex operation.
[8] All channel spacing is 25 kHz

33cm MHz Band Plan

902 - 902.3	Weak signal activities - NO FM ALLOWED
902.3 - 903	Repeater inputs[1 2]
903 - 904	Experimental Channel 1 [3]
903.1	Weak Signal Calling
904 - 912	Channel 1 [3]
912 - 918	ATV[1]
918 - 926	Channel 2 [3]
926 - 927	Experimental Channel 2 [3]
927 - 927.3	Digital
927.3 - 928	Repeater Outputs[1 2]
927.5	National FM simplex calling

Notes:
[1] WWARA Coordination recommended
[2] All FM and data channels at 25 kHz spacing
[3] Automatic Vehicle Monitoring (AVM) is the primary user in this segment

23cm MHz Band Plan

1240-1246	ATV #1 [3]
1246-1247	NB FM Links[1 2]
1247-1252	D-STAR DD mode repeaters[8]
1252-1258	ATV #2 [3]
1258-1270	Satellite Uplinks, Experimental, Simplex ATV[4]
1270-1271	D-STAR DV mode repeater inputs[5]

1270-1275	Repeater Inputs[1 2]
1275-1276	Narrowband Simplex[1 6]
1276-1282	ATV #3 [3]
1282-1290	Wide & Narrow Band FM Links[1]
1290-1291	D-STAR DV mode repeater outputs[5]
1290-1295	Repeater Outputs[1 2]
1292.5	FM cross-band linking frequency
1294.5	National FM simplex call channel
1295-1297	NB, Weak signal - NO FM
1296.1	National SSB call channel
1297-1300	Digital Communications[7 8]

Notes:
[1] All FM simplex and repeater channels are on 25kHz spacing
[2] WWARA coordination recommended
[3] ATV repeater operation, WWARA coordination recommended
[4] Care should be exercised when using this segment to prevent interference to satellite communications
[5] Includes other narrowband modes with 25kHz spacing
[6] Recommended for D-STAR DV simplex operations
[7] Divided into ten 300kHz channels available for D-STAR DD mode simplex and repeater operations
[8] D-STAR DD systems will not be "coordinated" or offered any protection. WWARA will record their existence and make that information available.

WWARA DIGITAL COORDINATION

The following is the WWARA policy regarding Packet Radio Systems (see the current coordination policies for latest rules):

a. The WWARA shall not issue Certificate of Coordination to any digital systems, except when the proposed system requires;
   1. Use of a standard repeater pair or link frequencies.
   2. Use of spectrum previously and or historically coordinated for non-packet relay systems lying outside of established and recognized Packet Radio spectrum.
b. The WWARA shall protect existing coordinated co-site and adjacent frequency repeater from the effects of system performance degradation caused by Packet Radio Systems. Conventional FCC interference criteria will be used to determine degradation.
c. The WWARA shall work with the ARRL, regional coordination organizations, as well as local and regional Packet Radio organization in the development of band plans that will set out specific band for Packet Radio communications.

SHARED NON PROTECTED REPEATERS

The WWARA has established several Shared Non Protected (SNP) repeater pairs. SNP systems should be registered by frequency and CTCSS tone and be kept current. Registration or Notification of intended use of a SNP frequency may be by either filling out a WWARA Technical data sheet and mailing to the WWARA official mail address or by using the WWARA on-line registration process at www.wwara.org.

Questions not answered in this section should be referred to the appropriate WWARA representative or Board member. See the current coordination policies for the latest rules.

Other guidelines for the use of these frequencies are:

a. All users of these frequencies shall share the use of it.
b. Users receive no interference protection from other co-channel users.
c. All systems shall use CTCSS access or other approved methods of limited access. No COR operation of any kind is permitted. The WWARA Band Chairmen shall track utilization of SNP frequencies within their respective bands and make this information available to all those requesting the same.

d. Operation of SNP systems shall be on a non-interference basis with other coordinated systems as defined in CFR 47, Part 97.
e. Use of SNP frequencies shall be restricted to voice/non-data and shall not be linked to other repeaters.
f. The use of radios capable of cross band operation to facilitate a temporary repeater should not be used for a permanent installation but may be used for specific events not to exceed the duration of the event (typically two days). Physical separation of the radios should not exceed 1 mile. Transmitter power shall be the lowest power possible to facilitate communications as per CFR 47, Part 97. The WWARA recommends pre-registering prior to operation. Cross Band Operation section may also apply.
g. The SNP pairs using standard frequency paring are:

6 meters	51.19 - 52.99
2 meters	144.53-145.13 and 144.69 - 145.29
222 MHz	223.12 - 224.72 and 223.24 - 224.84
440 MHz	445.00 - 440.00 and 448.00 - 443.00

h. Power recommendations (elevations in AMSL, Power is ERP in Watts)
   0-500' - 20 Watts
   501 - 1000' - 10 Watts
   1001’ and greater may be recommended on a case by case basis by the WWARA or operated during a declared emergency.

CROSS BAND REPEATER / DUPLEX RADIO RECOMMENDATIONS

See the current coordination policies for the latest rules.

Cross band repeater or duplex radios should:
a. Never be used to link to an established repeater system or to link two established repeaters together without the express approval of the repeater owners.
b. Be used for temporary, short duration activities only and never installed as a long-term communication facility.
c. Utilize the minimum power necessary as per CFR47, Part 97 to accomplish the desired communications. A transmitter placed in the vicinity of the operator should use a non-radiation load or be configured for minimum power output on a unity gain antenna.
d. Utilize CTCSS decode and encode circuitry to minimize uninvited access and unnecessary frequency congestion. Care should be exercised to use a unique CTCSS tone.
e. Be identified every 10 minutes in accordance with CFR47, Part 97.
f. Be disabled by its operator within 15 minutes of notification of interference or other problems as defined in CFR47, Part 97.
g. Should be continually monitored by the operator to minimize interference.

Recommended cross band frequencies are:

10 Meters	29.600
6 Meters	52.570
2 Meters	146.600
1.25m	224.000
70cm	440.025
23cm	1292.500

§97.303 FCC Frequency sharing requirements

The following is a summary of the frequency sharing requirements that apply to amateur station transmissions on the frequency bands specified in §97.301 of this Part. (For each ITU Region, each frequency band allocated to the amateur service is designated as either a secondary service or a primary service. A station in a secondary service must not cause harmful interference to, and must accept

interference from, stations in a primary service. See §§2.105 and 2.106 of the FCC Rules, *United States Table of Frequency Allocations* for complete requirements.)

(a) Where, in adjacent ITU Regions or sub-Regions, a band of frequencies is allocated to different services of the same category (i.e., primary or secondary allocations), the basic principle is the equality of right to operate. Accordingly, stations of each service in one Region or sub-Region must operate so as not to cause harmful interference to any service of the same or higher category in the other Regions or sub-Regions. (See ITU Radio Regulations, edition of 2004, No. 4.8.)

(b) No amateur station transmitting in the 1900-2000 kHz segment, the 70 cm band, the 33 cm band, the 23 cm band, the 13 cm band, the 9 cm band, the 5 cm band, the 3 cm band, the 24.05-24.25 GHz segment, the 76-77.5 GHz segment, the 78-81 GHz segment, the 136-141 GHz segment, and the 241-248 GHz segment shall not cause harmful interference to, nor is protected from interference due to the operation of, the Federal radiolocation service.

(c) No amateur station transmitting in the 1900-2000 kHz segment, the 3 cm band, the 76-77.5 GHz segment, the 78-81 GHz segment, the 136- 141 GHz segment, and the 241-248 GHz segment shall cause harmful interference to, nor is protected from interference due to the operation of, stations in the non-Federal radiolocation service.

(d) No amateur station transmitting in the 30 meter band shall cause harmful interference to stations authorized by other nations in the fixed service. The licensee of the amateur station must make all necessary adjustments, including termination of transmissions, if harmful interference is caused.

(e) In the 1.25 m band:

> (1) Use of the 219-220 MHz segment is limited to amateur stations participating, as forwarding stations, in point-to-point fixed digital message forwarding systems, including intercity packet backbone networks. It is not available for other purposes.
>
> (2) No amateur station transmitting in the 219-220 MHz segment shall cause harmful interference to, nor is protected from interference due to operation of Automated Maritime Telecommunications Systems (AMTS), television broadcasting on channels 11 and 13, 218-219 MHz Service systems, Land Mobile Services systems, or any other service having a primary allocation in or adjacent to the band.
>
> (3) No amateur station may transmit in the 219-220 MHz segment unless the licensee has given written notification of the station's specific geographic location for such transmissions in order to be incorporated into a data base that has been made available to the public. The notification must be given at least 30 days prior to making such transmissions. The notification must be given to:
>
> The American Radio Relay League
> 225 Main Street
> Newington, CT 06111-1494
>
> (4) No amateur station may transmit in the 219-220 MHz segment from a location that is within 640 km of an AMTS Coast Station that uses frequencies in the 217-218/219-220 MHz AMTS bands unless the amateur station licensee has given written notification of the station's specific geographic location for such transmissions to the AMTS licensee. The notification must be given at least 30 days prior to making such transmissions. The location of AMTS Coast Stations using the 217-218/219-220 MHz channels may be obtained from either:

The American Radio Relay League
225 Main Street
Newington, CT 06111-1494

or

Interactive Systems, Inc.
Suite 1103
1601 North Kent Street
Arlington, VA 22209
Fax: (703) 812-8275
Phone: (703) 812-8270

(5) No amateur station may transmit in the 219-220 MHz segment from a location that is within 80 km of an AMTS Coast Station that uses frequencies in the 217-218/219-220 MHz AMTS bands unless that amateur station licensee holds written approval from that AMTS licensee. The location of AMTS Coast Stations using the 217-218/219-220 MHz channels may be obtained as noted in paragraph (e)(4) of this section.

(f) In the 70 cm band:

(1) No amateur station shall transmit from north of Line A in the 420-430 MHz segment.

(2) The 420-430 MHz segment is allocated to the amateur service in the United States on a secondary basis, and is allocated in the fixed and mobile (except aeronautical mobile) services in the International Table of allocations on a primary basis. No amateur station transmitting in this band shall cause harmful interference to, nor is protected from interference due to the operation of, stations authorized by other nations in the fixed and mobile (except aeronautical mobile) services.

(3) The 430-440 MHz segment is allocated to the amateur service on a secondary basis in ITU Regions 2 and 3. No amateur station transmitting in this band in ITU Regions 2 and 3 shall cause harmful interference to, nor is protected from interference due to the operation of, stations authorized by other nations in the radiolocation service. In ITU Region 1, the 430-440 MHz segment is allocated to the amateur service on a co-primary basis with the radiolocation service. As between these two services in this band in ITU Region 1, the basic principle that applies is the equality of right to operate. Amateur stations authorized by the United States and radiolocation stations authorized by other nations in ITU Region 1 shall operate so as not to cause harmful interference to each other.

(4) No amateur station transmitting in the 449.75-450.00 MHz segment shall cause interference to, nor is protected from interference due to the operation of stations in, the space operation and space research services.

(g) In the 33 cm band:

(1) In the States of Colorado and Wyoming, bounded by the area of latitude 39° N. to 42° N. and longitude 103° W. to 108° W., an amateur station may transmit in the 902 MHz to 928 MHz band only on the frequency segments 902.0-902.4, 902.6-904.3, 904.7- 925.3, 925.7-927.3, and 927.7-928.0 MHz. This band is allocated on a secondary basis to the amateur service subject to not causing harmful interference to, and not receiving any interference protection from, the operation of industrial, scientific and medical devices, automatic vehicle monitoring systems, or Government stations authorized in this band.

(2) No amateur station shall transmit from those portions of the States of Texas and New Mexico bounded on the south by latitude 31° 41' N, on the north by latitude 34° 30' N, on the east by longitude 104° 11' W, and on the west by longitude 107° 30' W.

(h) No amateur station transmitting in the 23 cm band, the 3.3-3.4 GHz segment, the 3 cm band, the 24.05-24.25 GHz segment, the 76-77.5 GHz segment, the 78-81 GHz segment, the 136-141 GHz segment, and the 241-248 GHz segment shall cause harmful interference to, nor is protected from interference due to the operation of, stations authorized by other nations in the radiolocation service.

(i) In the 23 cm band, no amateur station shall cause harmful interference to, nor is protected from interference due to the operation of, stations in the radionavigation-satellite service, the aeronautical radionavigation service, the Earth exploration-satellite service (active), or the space research service (active).