National Radio Astronomy Observatory
Socorro, New Mexico

VLA-VLBA INTERFERENCE MEMO No. 3

U.S. Frequency Allocations and Footnotes

for Radio Astronomy and Passive Radio Services

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Radio Astronomy, Earth Exploration-Satellite (passive) and Space Research (passive) radio services have a small fraction of the radio spectrum allocated to them. Most of that fraction of spectrum is shared with other radio services which emit power levels many orders of magnitude higher than the sensitivity of the receivers of the passive services, especially radio astronomy.

At every location on and above the earth, the incident radio spectrum occupancy and power flux densities increase with time. The increase accelerates. Although more spectrum usage provides more communications and identification/location services for more people, it creates radio polluting interference that degrades the scientific capabilities of the passive users of the radio spectrum.

Frequency allocations by the International Telecommunications Union (ITU), and in the U.S. by the National Telecommunications and Information Administration (NTIA) and the Federal Communications Commission (FCC), set the framework within which spectrum usage and pollution evolve.

Therefore the frequency allocation table and footnotes to the table provide a means for the passive services to predict potential interference currently and for the future, and to help identify sources of observed interference.

A primary service cannot claim protection from harmful interference from another primary service which shares the same allocation. A secondary service shall not cause harmful interference to a primary service, and cannot claim protection from harmful interference from a primary service. Footnotes may add allocations, and may add limited protection or remove protection from harmful interference for a service.

Through the VLA-VLBA Interference Memo series of NRAO - Socorro, we provide the U.S. frequency allocations and footnotes for the passive radio services. We will update this approximately annually, after significant changes appear in the NTIA semi-annual revisions. The next major revision will occur when the U.S. Senate ratifies the ITU WARC-92 treaty. Future ITU World Radio Councils (WRC) will revise the allocations. Perhaps we will make this memo available on Internet World Wide Web via the NRAO home page.

U.S. Frequency Allocations and Footnotes
for Radio Astronomy (RA),
for Earth Exploration-Satellite (passive) (EES),
for Space Research (passive) (SR)

Revised 27 October 1994

Extracted from NTIA Manual of Regulations
Revised May 1994

13.36- 13.41 MHz	RA PRIMARY, Footnote 533 Footnote G115
25.55- 25.67 MHz	RA PRIMARY, Footnotes US74, 545
37.50- 38.00 MHz	RA Secondary, Footnote 547 PRIMARY Land Mobile Footnotes NG59, NG124
38.00- 38.25 MHz	RA PRIMARY, Footnotes US81, 547 PRIMARY Fixed and Mobile
73.00- 74.60 MHz	RA PRIMARY, Footnote US74
(150.05-153.00 MHz)	No U.S. RA Allocation, ITU Region 1 only U.S. Fixed, Mobile, and Land Mobile
322.00- 328.60 MHz	RA by Footnote 644 (deuterium) PRIMARY FIXED and MOBILE, Footnotes G27, G100
406.10- 410.00 MHz	RA PRIMARY, Footnotes US74, US117 PRIMARY FIXED and MOBILE, Footnotes G5, G6, US13
608.00- 614.00 MHz	RA PRIMARY, Footnotes US74, US246
1330.00-1350.00 MHz	RA by Footnote 718 PRIMARY Aeronautical Radionavigation Secondary Radiolocation Footnotes G2, 717
1350.00-1400.00 MHz	RA by Footnotes US 311, 718 (Redshifted

	hydrogen) PRIMARY Fixed, Mobile, and Radiolocation Footnotes G2, G27, G114, 714
1370.00-1400.00 MHz	EES, SR Secondary by Footnote 720
1400.00-1427.00 MHz	RA PRIMARY, Footnote US74 EES, SR PRIMARY Footnotes US246, 722
1610.60-1613.80 MHz	RA Secondary by Footnote 734 (PRIMARY/WRC92) 1612-MHz hydroxyl PRIMARY Aeronautical Radionavigation Footnotes US208, US260, US306, 722, 732, 733
1660.00-1660.50 MHz	RA PRIMARY, Footnotes US74, US99, 736 (OH) PRIMARY Aeronautical Mobile-Satellite (R) (Earth-to-space) Footnotes US309, 722, 726A
1660.50-1668.40 MHz	RA PRIMARY, Footnote US74 (OH) SR PRIMARY Footnotes US246, 722
1668.40-1670.00 MHz	RA PRIMARY, Footnotes US74, US99, US211, 736 (OH) PRIMARY Meteorological Aids (radiosonde) Footnote 722
1718.80-1722.20 MHz	RA unprotected by Footnote US256 (OH) PRIMARY Fixed and Mobile Footnote 722
2640.00-2655.00 MHz	EES, SR secondary by Footnote 720
2655.00-2690.00 MHz	RA secondary, Footnote US269 EES, SR secondary PRIMARY Broadcasting-Satellite (space-to-earth), Fixed Footnotes NG47, NG101, NG102, US205
2690.00-2700.00 MHz	RA PRIMARY, Footnote US74 EES, SR PRIMARY

	Footnote US246
3260.00-3267.00 MHz	RA by Footnote 778 (CH) PRIMARY Radiolocation Footnotes G59, US110, 713
3332.00-3339.00 MHz	RA by Footnote 778 (CH) PRIMARY Radiolocation Footnotes G59, US110, 713
3345.80-3352.50 MHz	RA by Footnote 778 (CH) PRIMARY Radiolocation Footnotes G59, US110, 713
4825.00-4835.00 MHz	RA by Footnotes US203, 778 (CH, formaldehyde) PRIMARY Fixed and Mobile
4950.00-4990.00 MHz	RA by Footnote US257 EES, SR secondary by Footnote 720 PRIMARY Fixed and Mobile
4990.00-5000.00 MHz	RA PRIMARY, Footnotes US74, US211 SR secondary Footnote US246
10.60 - 10.68 GHz	RA PRIMARY unprotected by Footnote US 277 EES, SR PRIMARY PRIMARY Fixed, Footnote US265
10.68 - 10.70 GHz	RA PRIMARY, Footnotes US74, US211 EES, SR PRIMARY Footnote US246
14.47 - 14.50 GHz	RA by Footnotes US203, 862 (Formaldehyde) PRIMARY Fixed-Satellite (earth-to-space) Secondary Mobile and Fixed Secondary Land Mobile-satellite (earth-to-space), Footnote US287
15.20 - 15.35 GHz	EES, SR secondary by Footnote 720 PRIMARY Fixed Secondary Mobile

15.35 - 15.40 GHz	RA PRIMARY, Footnotes US74, US211 EES, SR PRIMARY Footnote US246
18.60 - 18.80 GHz	EES, SR PRIMARY PRIMARY Fixed, Fixed-satellite (space-to-earth), Mobile except aeronautical mobile Footnotes US254, US255, NG144
21.20 - 21.40 GHz	EES, SR PRIMARY unprotected by footnote US263 PRIMARY Fixed, Mobile
22.01 - 22.21 GHz	RA by Footnote 874 (Water vapor) PRIMARY Fixed, Mobile (except aeronautical mobile)
22.21 - 22.50 GHz	RA PRIMARY, Footnotes US211, 875 (water vapor) EES, SR PRIMARY unprotected by footnote US263 PRIMARY Fixed, Mobile (except aeronautical mobile)
22.81 - 22.86 GHz	RA by Footnote 879 PRIMARY Broadcasting-Satellite, Inter-Satellite, Fixed, Mobile Footnote US278
23.07 - 23.12 GHz	RA by Footnote 879 PRIMARY Inter-Satellite, Fixed, Mobile Footnote US278
23.60 - 24.00 GHz	RA PRIMARY, Footnotes US74, US211 EES, SR PRIMARY Footnote US246
31.20 - 31.30 GHz	RA by Footnote 886 PRIMARY Fixed, Mobile Secondary Standard Frequency and Time Signal-Satellite (space-to-earth)

31.30 - 31.80 GHz	RA PRIMARY, Footnotes US74, US211 EES, SR PRIMARY Footnote US246
36.00 - 37.00 GHz	EES, SR PRIMARY unprotected by Footnote US263 PRIMARY Fixed, Mobile
36.43 - 36.50 GHz	RA by Footnote 898 PRIMARY Fixed, Mobile
42.50 - 43.50 GHz	RA PRIMARY, Footnotes US211, 900 PRIMARY Fixed, Fixed-Satellite (Earth-to-space), and Mobile (except aeronautical mobile)
48.94 - 49.04 GHz	RA PRIMARY by Footnote 904 PRIMARY Fixed, Mobile, and Fixed-Satellite (earth-to-space) Footnotes US264, US297
50.20 - 50.40 GHz	EES, SR PRIMARY unprotected by Footnote US263 PRIMARY Fixed, Mobile
51.40 - 54.25 GHz	RA PRIMARY EES, SR PRIMARY Footnote US246
54.25 - 58.20 GHz	EES, SR PRIMARY unprotected by Footnote US263 PRIMARY Inter-satellite, Fixed, Mobile Footnote 909
58.20 - 59.00 GHz	RA PRIMARY EES, SR PRIMARY Footnote US246
64.00 - 65.00 GHz	RA PRIMARY EES, SR PRIMARY Footnote US246
72.77 - 72.91 GHz	RA by Footnote US270

	PRIMARY Fixed, Fixed-Satellite (earth-to-space), Mobile-Satellite (earth-to-space), Mobile
86.00 - 92.00 GHz	RA PRIMARY, Footnotes US74, US211 EES, SR PRIMARY Footnote US246
93.07 - 93.27 GHz	RA by Footnote 914 Primary Fixed, Mobile, Fixed-Satellite (earth-to-space), Radiolocation
97.88 - 98.08 GHz	RA PRIMARY by Footnote 904 PRIMARY Mobile, Mobile-Satellite, Radionavigation, Radionavigation-Satellite Secondary Radiolocation Footnotes 902, 903
100.00 - 102.00 GHz	EES, SR PRIMARY Footnotes US246, 722
105.00 - 116.00 GHz	RA PRIMARY, Footnotes US 74, US211 (CO) EES, SR PRIMARY Footnotes US246, 722
116.00 - 126.00 GHz	EES, SR PRIMARY unprotected by Footnote US263 PRIMARY Inter-satellite, Fixed, Mobile Footnotes 722, 909, 915, 916
122.00 - 123.00 GHz	Industrial-Scientific-Medical (ISM)
140.69 - 140.98 GHz	RA PRIMARY by Footnote 918 PRIMARY Mobile, Mobile-Satellite, Radionavigation, Radionavigation-Satellite Secondary Radiolocation Footnotes 902, 903, 917
144.68 - 144.98 GHz	RA PRIMARY by Footnote 918 Primary Radiolocation Secondary Amateur, Amateur-Satellite
145.45 - 145.75 GHz	RA PRIMARY by Footnote 918

	PRIMARY Radiolocation Secondary Amateur, Amateur-Satellite
146.82 - 147.12 GHz	RA PRIMARY by Footnote 918 Primary Radiolocation Secondary Amateur, Amateur-Satellite
150.00 - 151.00 GHz	RA Secondary by Footnote 919, Footnote US211 EES, SR PRIMARY unprotected by Footnote US263 PRIMARY Fixed-satellite (space-to-earth), Fixed, Mobile
164.00 - 168.00 GHz	RA PRIMARY, Footnote US211 EES, SR PRIMARY Footnote US246
174.42 - 174.50 GHz	RA Secondary by Footnote 919, Footnote US211 PRIMARY Fixed, Inter-Satellite, Mobile Footnote 909
174.50 - 175.02 GHz	RA Secondary by Footnote 919, Footnote US211
174.50 - 176.50 GHz	EES, SR PRIMARY unprotected by Footnote US263 PRIMARY Inter-Satellite, Fixed, Mobile Footnote 909
177.00 - 177.40 GHz	RA Secondary by Footnote 919 PRIMARY Fixed, Inter-Satellite, Mobile Footnote 909
178.20 - 178.60 GHz	RA Secondary by Footnote 919 PRIMARY Fixed, Inter-Satellite, Mobile Footnote 909
181.00 - 181.46 GHz	RA Secondary by Footnote 919 PRIMARY Fixed, Inter-Satellite, Mobile Footnote 909
182.00 - 185.00 GHz	RA PRIMARY, Footnote US211 EES, SR PRIMARY Footnote US246

186.20 - 186.60 GHz	RA Secondary by Footnote 919 PRIMARYFixed, Inter-Satellite, Mobile Footnote 909
200.00 - 202.00 GHz	EES, SR PRIMARY unprotected by Footnote US263 PRIMARY Fixed, Mobile Footnote 722
217.00 - 231.00 GHz	RA PRIMARY, Footnote US74, US211 EES, SR PRIMARY Footnotes US246, 722
235.00 - 238.00 GHz	EES, SR PRIMARY unprotected by Footnote US263 PRIMARY Fixed-satellite (space-to-earth), Fixed, Mobile
250.00 - 251.00 GHz	RA PRIMARY by Footnote 923
250.00 - 252.00 GHz	EES, SR PRIMARY, Footnote US211
257.50 - 258.00 GHz	RA Secondary by Footnote 924 PRIMARY Mobile, Mobile-Satellite, Radionavigation-Satellite, Radionavigation Footnotes 902, 903
262.24 - 262.76 GHz	RA Secondary by Footnote 923 PRIMARY Mobile, Mobile-Satellite, Radionavigation-Satellite, Radionavigation Footnotes 902, 903
265.00 - 275.00 GHz	RA PRIMARY, Footnotes US211, 926 PRIMARY Fixed, Fixed-Satellite (earth-to-space), and Mobile
275.00 - 277.00 GHz	EES, SR by Footnote 927 PRIMARY Fixed, Mobile
278.00 - 280.00 GHz	RA by Footnote 927 PRIMARY Fixed, Mobile

300.00 - 302.00 GHz	EES, SR by Footnote 927 PRIMARY Fixed, Mobile
324.00 - 326.00 GHz	EES, SR by Footnote 927 PRIMARY Fixed, Mobile
343.00 - 348.00 GHz	RA by Footnote 927 PRIMARY Fixed, Mobile
345.00 - 347.00 GHz	EES, SR by Footnote 927 PRIMARY Fixed, Mobile
363.00 - 365.00 GH	EES, SR by Footnote 927 PRIMARY Fixed, Mobile
379.00 - 381.00 GHz	EES, SR by Footnote 927 PRIMARY Fixed, Mobile

GOVERNMENT (U.S.) FOOTNOTES REFERENCED ABOVE

G2-In the bands 216-225, 420-450 (except as provided by US217), 890-902, 928-942, 1300-1400, 2300-2450, 2700-2900, 5650-5925, and 9000-9200 MHz, the Government radiolocation is limited to the military services.

G5-In the bands 162.0125-173.2, 173.4-174, 406.1-410 and 410-420 MHz, the fixed and mobile services are all allocated on a primary basis to the Government non-military agencies.

G6-Military tactical fixed and mobile operations may be conducted nationally on a secondary basis; (1) to the meteorological aids service in the band 403-406 MHz; and (2) to the radio astronomy service in the band 406.1-410 MHz. Such fixed and mobile operations are subject to local coordination to ensure that harmful interference will not be caused to the services to which the bands are allocated.

G27-In the bands 225-328.6, 335.4-399.9, and 1350-1400 MHz, the fixed and mobile services are limited to the military services.

G30-In the bands 138-144, 148-149.9, 150.05-150.8, 1427-1429 and 1429-1435 MHz, the fixed and mobile services are limited primarily to operations by the military services.

G31-In the bands 3300-3500 MHz, the Government radiolocation is limited to the military services, except as provided by footnote US108.

G59-In the bands 902-928 MHz, 3100-3300 MHz, 3500-3700 MHz, 5250-5650 MHz, 8500-9000 MHz, 9200-9300 MHz, 13.4-14.0 GHz, 15.7-17.7 GHz and 24.05-24.25 GHz, all Government non-military radiolocation shall be secondary to military radiolocation, except in the sub-band 15-7-16.2 GHz airport surface detection equipment (ASDE) is permitted on a co-equal basis subject to coordination with the military departments.

G100-The bands 235-322 MHz and 335.4-399.9 MHz are also allocated on a primary basis to the mobile-satellite service, limited to military operations.

G101-In the band 2200-2290 MHz, space operations (Space-to-Earth) and (Space-to-Space), and earth exploration-satellite (Space-to-Earth) and (Space-to-Space) services, may be accommodated on a co-equal basis with fixed, mobile and space research service.

G114-In the band 1350-1400 MHz, the frequency 1381.05 MHz with emissions limited to +-12 MHz is also allocated to Fixed and Mobile Satellite Services (Space-to-Earth) for the relay of nuclear burst data.

G115-In the band 13360-13410 kHz, the fixed service is allocated on a primary basis outside the coterminous United States. Within the coterminous United States, assignments in the fixed service are permitted, and will be protected for national defense purposes or, if they are to be used only in an emergency jeopardizing life, public safety, or important property under conditions calling for immediate communication where other means of communication do not exist.

NON-GOVERNMENT (U.S.) FOOTNOTES REFERENCED ABOVE

NG47-In the band 2500-2690 MHz, channels in 2500-2686 MHz and the corresponding response frequencies 2686.0625-2689.8125 Mhz may be assigned to stations in the Instructional Television Fixed Service (Part 74 of this Chapter) CFR47; channels in 2596-2644 MHz and response frequencies 2686.5625-2689.6875 MHz may be assigned to Multipoint Distribution Services stations (Part 21 of this Chapter); and channels 2650-2656 MHz, 2662-2668 MHz and 2674-2680 MHz and response frequencies 2686.9375 MHz, 2687.9375 MHz and 2688.9375 MHz may be assigned to stations in the Operational Fixed Service (Part 94 of this Chapter). In Alaska, however, frequencies within the band 2655-2690 MHz are not available for assignment to terrestrial stations.

NG59-The frequencies 37.60 and 37.85 MHz may be authorized only for use by base, mobile and operational fixed stations participating in an interconnected or coordinated power service utility system.

NG101-The use of the band 2500-2690 MHz by the broadcasting-satellite service is limited to domestic and regional systems for community reception of educational television programming and public service information. Such use is subject to agreement among administrations concerned and those having services operating in accordance with the table, which may be affected. Unless such agreement includes the use of higher values, the power flux-density at the earth's surface produced by emissions from a space station in this service shall not exceed those values set forth in Part 73 of the rules for this frequency band.

NG102-The frequency bands 2500-2655 MHz (space-to-Earth) and 2655-2690 MHz (Earth-to-space) are allocated for use in the fixed-satellite service as follows:

(a) For common carrier use in Alaska, for intra-Alaska service only, and, in the mid and western Pacific area including American Samoa, the Trust Territory of the Pacific Island, Guam and Hawaii;

(b) For educational use in the contiguous United States, Alaska, and the mid and western Pacific area including American Samoa, the Trust Territory of the Pacific Island, Guam and Hawaii.

Such use is subject to agreement with administrations having services operating in accordance with the table, which may be affected. In the band 2500-2655 MHz unless such agreement includes the use of higher values, the power flux density at the earth's surface produced by emissions from a space station in this service shall not exceed the values set forth in Part 25 of the rules for this frequency band.

NG124-In the Public Safety Radio Service allocation within the bands 30-50 MHz, 150-174 MHz and 450-470 MHz, Police Radio Service licensees are authorized to operate low powered radio transmitters on a secondary non-interference basis in accordance with the provisions of Section 2.803 and 90.19 (f) (5) of the Rules.

NG144-Stations authorized as of September 9, 1983, to use frequencies in the band 17.7-19.7 GHz may, upon proper application, continue to be authorized for such operation.

U. S. FOOTNOTES REFERENCED ABOVE

US13-For the specific purpose of transmitting hydrological and meteorological data in cooperation with agencies of the Federal Government, the following frequencies may be authorized to non-Government fixed stations on the condition that harmful interference will not be caused to Government stations:

MHz	MHz	MHz	MHz
169.425	170.275	171.125	406.175
169.450	170.300	171.825	409.675
169.475	170.325	171.850	409.725

169.500	171.025	171.875	412.625
169.525	171.050	171.900	412.675
160.225	171.075	171.925	412.725
170.250	171.100	406.125	412.775

Licensees holding a valid authorization on June 11, 1962, to operate on the frequencies 169.575, 170.375, or 171.975 MHz may continue to be authorized for such operations on the condition that harmful interference will not be caused to Government stations.

US74-In the bands 25.55-25.67, 73-74.6, 406.1-410, 608-614, 1400-1427, 1660.5-1670, 2690-2700, and 4990-5000 MHz, and in the bands 10.68-1.7, 15.35-15.4, 23.6-24, 31.3-31.8, 86-92, 105-116, and 217-231 GHz, the radio astronomy service shall be protected from extraband radiation only to the extent such radiation exceeds the level which would be present if the offending station were operating in compliance with the technical standards or criteria applicable to the service in which it operates.

US81-The band 38-38.25 MHz is used by both Government and non-Government radio astronomy observatories. No new fixed or mobile assignments are to be made and Government stations in the band 38-38.25 MHz will be moved to other bands on a case-by-case basis, as required, to protect radio astronomy observations from harmful interference. As an exception, however, low powered military transportable and mobile stations used for tactical and training purposes will continue to use the band. To the extent practicable, the latter operations will be adjusted to relieve such interference as may be caused to radio astronomy operations. In the event of harmful interference from such local operations, radio astronomy observatories may contact local military commands directly, with a view to effecting relief. A list of military commands, areas of coordination, and points of contact for purposes of relieving interference may be obtained upon request from the Office of the Chief Scientist, Federal Communications Commission, Washington, D.C. 20554.

US99-In the band 1668.4-1670 MHz, the meteorological aids service (radiosonde) will avoid operations to the maximum extent possible. Whenever it is necessary to operate radiosondes in the band 1668.4-1670 MHz within the United States, notification of the operations shall be sent as far in advance as possible to the Electromagnetic Spectrum Management Unit, National Science Foundation, Washington, D.C. 20550.

US110-In the frequency bands 3100-3300 MHz, 3500-3700 MHz, 5250-5350 MHz, 8500-9000 MHz, 9200-9300 MHz, 9500-10000 Mhz 13.4-14.0 GHz, 15.7-17.3 GHz, 24.05-24.25 GHz, and 33.4-36 GHz, the non-Government radiolocation service shall be secondary to the Government radiolocation service and to airborne doppler radars at 8800 MHz, and shall provide protection to airport surface detection equipment (ASDE) operating between 15.7-16.2 GHz.

US117-In the band 406.1-410 MHz, all new authorizations will be limited to a maximum 7 watts

per kHz of necessary bandwidth; existing authorizations as of November 30, 1970 exceeding this power are permitted to continue in use.

New authorizations in this band for stations, other than mobile stations, within the following areas are subject to prior coordination by the applicant through the Electromagnetic Spectrum Management Unit, National Science Foundation,
Washington, D.C. 20550 (202-357-9696):

Arecibo Observatory:
Rectangle between latitudes 17° 30' N and 19° 00' N and between longitudes 65° 10' W and 68° 00' W.

Owens Valley Radio Observatory:
Two contiguous rectangles, one between latitudes 36° N and 37° N and between longitudes 117° 40' W and 118° 30' W and the second between latitudes 37° N and 38° N and between longitudes 118° W and 118° 50' W.

Sagamore Hill Radio Observatory:
Rectangle between latitudes 42d 10' N and 43d 00' N and between longitudes 70d 31' W and 71d 31' W.

Table Mountain Solar Observatory (NOAA)
Boulder, Colorado (407-409 MHz only):
Rectangle between latitudes 39d 30' N and 40d 30' N and between longitudes 104d 30' W and 106d 00' W or the Continental Divide whichever is farther east.

The non-Government use of this band is limited to the radio astronomy service and as provided by footnote US13.

US203-Radio astronomy observations of the formaldehyde line frequencies 4825-4835 MHz and 14.470-14.500 GHz may be made at certain radio astronomy observatories as indicated below:

Bands to be observed		Observatory
4 GHz	14 GHz	
X		National Astronomy and Ionospheric Center Arecibo, Puerto Rico
X	X	National Radio Astronomy Observatory Green Bank, West Virginia
X	X	National Radio Astronomy Observatory Socorro, New Mexico
X	X	Hat Creek Observatory (U of Calif.)

		Hat Creek, California
X	X	Haystack Radio Observatory (MIT-Lincoln Lab) Tyngsboro, Massachusetts
X	X	Owens Valley Radio Observatory (Cal. Tech.) Big Pine, California
	X	Five College Radio Astronomy Observatory Quabbin Reservoir (near Amherst), Massachusetts

Every practicable effort will be made to avoid the assignment of frequencies to stations in the fixed or mobile services in these bands. Should such assignments result in harmful interference to these observations, the situation will be remedied to the extent practicable.

US205-Tropospheric scatter systems are prohibited in the band 2500-2690 MHz.

US208-Planning and use of the band 1559-1626.5 MHz necessitate the development of technical and/or operational sharing criteria to ensure the maximum degree of electromagnetic compatibility with existing and planned systems within the band.

US211-In the bands 1670-1690, 5000-5250 MHz, and 10.7-11.7, 15.1365-15.35, 15.4-15.7, 22.5-22.55, 24-24.05, 31.0-31.3, 40.5-42.5, 84-86, 102-105, 116-126, 151-164, 176.5-182, 185-190, 231-235, 252-265 GHz, applicants for airborne or space station assignments are urged to take all practicable steps to protect radio astronomy observations in the adjacent bands from harmful interference; however, US74 applies.

US246-No stations will be authorized to transmit in the bands 608-614 MHz, 1420-1427 MHz, 1660.5-1668.4 MHz, 2690-2700 MHz, 4990-5000 MHz, 10.68-10.70 GHz, 15.35-15.40 GHz, 23.6-24.0 GHz, 31.3-31.8 GHz, 51.4-54.25 GHz, 58.2-59.0 GHz, 64-65 GHz, 86-92 GHz, 100-102 GHz, 105-116 GHz, 164-168 GHz, 182-185 GHz and 217-231 GHz.

US254-In the band 18.6-18.8 GHz, the fixed and mobile services shall be limited to a maximum equivalent isotopically radiated power of +35 dBw and the power delivered to the antenna shall not exceed -3dBw.

US255- In the band 18.6-18.8 GHz, the fixed satellite service shall be limited to a power flux density at the Earth's surface of -101 dbW/m^2 in a 200 MHz band for all angles of arrival.

US256-Radio astronomy observations may be made in the band 1718.8-1722.2 MHz on an unprotected basis. Agencies providing other services in this band in the geographic areas listed below should bear in mind that their operations may affect those observations, and those agencies are encouraged to minimize potential interference to the observations insofar as it is practicable.

National Astronomy and Ionosphere Center	Rectangle between latitudes 17d30'N and 19d00'N and between longitudes

Arecibo, Puerto Rico	65d10'W and 68d00'W.
Haystack Radio Observatory Tyngsboro, Massachusetts	Rectangle between latitudes 41d00'N and 43d00'N and between longitudes 71d00'W and 73d00'W.
National Radio Astronomy Observatory Green Bank, West Virginia	Rectangle between latitudes 37d00'N and 39d15'N and between longitudes 78d30'W and 80d30'W.
National Radio Astronomy Observatory Socorro, New Mexico	Rectangle between latitudes 32d30'N and 35d30'N and between longitudes 106d00'W and 109d00'W.
Owens Valley Radio Observatory Big Pine, California	Two contiguous rectangles, one between latitudes 36d00'N and 37d00'N and between longitudes 117d40'W and 118d30'W and the second between latitudes 37d00'N and 38d00'N and between longitudes 118d00'W and 118d50'W.
Hat Creek Observator Hat Creek, California	Rectangle between latitudes 40d00'N and 42d00'N and between longitudes 120d15'W and 122d15'W.

US257-Radio astronomy observations may be made in the 4950-4990 MHz band at certain Radio Astronomy Observatories indicated below:

Hat Creek Observatory Hat Creek, California	Rectangle between latitudes 40d00'N and 42d00'N and between longitudes 120d15'W and 122d15'W.
Owens Valley Radio Observatory Big Pine, California	Two contiguous rectangles, one between latitudes 36d00'N and 37d00'N and between longitudes 117d40'W and 118d30'W and the second between latitudes 37d00'N and 38d00'N and between longitudes 118d00'W and 118d50'W.
Haystack Radio Observatory	Rectangle between latitudes 41d00'N and 43d00'N and between longitudes

Tyngsboro, Massachusetts	71d00'W and 73d00'W.
National Astronomy Ionosphere Center Arecibo, Puerto Rico	and Rectangle between latitudes 17d30'N and 19d00'N and between longitudes 65d10'W and 68d00'W.
National Radio Astronomy Observatory Socorro, New Mexico	Rectangle between latitudes 32d30'N and 35d30'N and between longitudes 106d00'W and 109d00'W.
National Radio Astronomy Observatory Green Bank, West Virginia	Rectangle between latitudes 37d00'N and 39d15'N and between longitudes 78d30'W and 80d30'W.

Every practicable effort will be made to avoid the assignment of frequencies in the band 4950-4990 MHz to stations in the fixed and mobile services within the geographic areas given above. In addition, every practicable effort will be made to avoid the assignment of frequencies in this band to stations in the aeronautical mobile service which operate outside of those geographic areas, but which may cause harmful interference to the listed observatories. Should such assignments result in harmful interference to these observatories, the situation will be remedied to the extent practicable.

US260-Aeronautical mobile communications which are an integral part of aeronautical radionavigation systems may be satisfied in the bands 1559-1626.5 MHz, 5000-5250 MHz and 15.4-15.7 GHz.

US263-In the frequency band 21.2-21.4, 22.21-22.5, 36-37, 50.2-50.4, 54.25-58.2, 116-126, 150-151, 174.5-176.5, 200-202 and 235-238 GHz, the Space Reasearch and the Earth Exploration-Satellite Services shall not receive protection from the Fixed and Mobile Services operating in accordance with the Table of Frequency Allocations.

US264-In the band 48.94-49.04 GHz, airborne stations shall not be authorized.

US265-In the band 10.6-10.68 GHz, the fixed service shall be limited to a maximum equivalent isotopically radiated power of 40 dBW and the power delivered to the antenna shall not exceed -3 dBW, per 250 kHz.

US269-In the band 2500-2690 MHz, applicants for space station assignments are urged to take all practicable steps to protect radio astronomy observations in the adjacent band, 2690-2700 MHz, from harmful interference. Further, all applicants are urged to coordinate their proposed systems through the Electromagnetic Spectrum Management Unit, National Science Foundation, Washington, D.C. 20550.

US270-The band 72.77-72.91 GHz is also allocated to the radio astronomy service. Applicants for frequency assignments in this band are urged to take all practicable steps to protect radio astronomy observations from harmful interference.

US277-The band 10.6-10.68 GHz is also allocated on a primary basis to the radio astronomy service. However, the radio astronomy service shall not receive protection from stations in the Fixed Service which are licensed to operate in the one hundred most populous urbanized areas as defined by the U.S. Census Bureau. The following radio astronomy sites have been coordinated for observations in this band: National Radio Astronomy Observatory, Green Bank, West Virginia (38 26 08N; 79 49 42W); National Radio Astronomy Observatory, Socorro, New Mexico (34 04 43N; 107 37 04W); Harvard Radio Astronomy Station, Fort Davis, Texas (30 38 08N; 103 56 42W); Hat Creek Observatory, Hat Creek, California (40 49 03N; 121 28 24W); Owens Valley Radio Observatory, Big Pine, California (37 13 54N; 118 17 36W); Naval Research Laboratory, Maryland Point, Maryland (38 22 26N; 77 14 00W).

US278-In the 22.55-23.55 and 32.33 GHz bands, non-geostationary inter-satellite links may operate on a secondary basis to geostationary inter-satellite links.

US287-The band 14-14.5 GHz is also allocated to the non-Government land mobile-satellite service (Earth-to-space) on a secondary basis.

US297-The bands 47.2-49.2 GHz and 74.0-75.5 GHz are also available for feeder links for the broadcasting-satellite service.

US303-In the band 2285-2290 MHz, non-Government space stations in the space research, space operations and earth-exploration-satellite services may be authorized to transmit to the Tracking and Data Relay Satellite System subject to such conditions as may be applied on a case-by-case basis. Such transmissions shall not cause harmful interference to authorized Government stations. The power flux density at the Earth's surface from such non-Government stations shall not exceed -144 to -154 dBW/m**2/4 kHz, depending on angle of arrival, in accordance with ITU Radio Regulation 2557.

US306-The band 1610-1626.5 MHz is also allocated for use by the radiodetermination satellite service in the Earth-to-space direction.

US309-Transmissions in the band 1545-1559 MHz from terrestrial aeronautical stations directly to aircraft stations, or between aircraft stations, in the aeronautical mobile (R) service are also authorized when such transmissions are used to extend or supplement the satellite-to-aircraft links. Transmissions in the band 1646.5-1660.5 MHz from aircraft stations in the aeronautical mobile (R) service directly to terrestrial aeronautical stations, or between aircraft stations, are also authorized when such transmissions are used to extend or supplement the aircraft-to-satellite links.

US311-Radio astronomy observations may be made in the 1350-1400 MHz band on an unprotected basis at certain Radio Astronomy Observatories indicated below:

National Astronomy and Ionosphere Center Arecibo, Puerto Rico	Rectangle between latitudes 17°30'N and 19°00'N and between longitudes 65°10'W and 68°00'W.	
National Radio Astronomy Observatory Socorro, New Mexico	Rectangle between latitudes 32°30'N and 35°30'N between longitudes 106°00'W and 109°00'W.	
National Radio Astronomy Observatory Green Bank, West Virginia	Rectangle between latitudes 37°30'N and 39°15'N and between longitudes 78°30'W and 80°30'W.	
National Radio Astronomy Observatory Very Long Baseline Array Stations	80 kilometers (50 mile) radius centered on:	
	Latitude (North)	Longitude (West)
Pie Town, NM	34°18'	108°07'
Kitt Peak, AZ	31°57'	111°37'
Los Alamos, NM	35°47'	106°15'
Fort Davis, TX	30°38'	103°47'(57')
North Liberty, IA	41°46'	91°41'(34')
Brewster, WA	48°08'	119°41'
Owens Valley, CA	37°14'	118°17'
Saint Croix, VI	17°46'	64°35'
Mauna Kea, HI	19°49'	155°28'
Hancock, NH	42°56'	71°59'

Every practicable effort will be made to avoid the assignment of frequencies in the band 1350-1400 MHz to stations in the fixed and mobile services which could interfere with radio astronomy observations within the geographic area given above. In addition, every practicable effort will be made to avoid assignment of frequencies in this band to stations in the aeronautical mobile service which operate outside of those geographic areas, but which may cause harmful interference to the listed observatories. Should such assignments result in harmful interference to these observatories, the situation will be to remedied to the extent practicable.

INTERNATIONAL FOOTNOTES REFERENCED ABOVE

533-In making assignments to stations of other services to which the band 13 360-13 410 kHz is allocated, administrations are urged to take all practicable steps to protect the radio astronomy service from harmful interference. Emissions from space or airborne stations can be particularly serious sources of interference to the radio astronomy service (see Nos. 343 and 344 and Article 36).

545-The band 25 550-25 600 kHz is allocated to the fixed and mobile, except aeronautical mobile, service on a primary basis subject to the procedure described in Resolution 8. The use of this band by the radio astronomy service shall be subject to the completion of the satisfactory transfer of all assignments to stations in the fixed and mobile, except aeronautical mobile, services operating in this band and recorded in the Master Register, in accordance with the procedure described in Resolution 8. The band 25 600-25 670 kHz is allocated to the broadcasting service on a primary basis, subject to provisions to be established by the world administrative radio conference for the planning of HF bands allocated to the broadcasting service (see Resolution 508). After completion of all the above mentioned provisions, all emissions capable of causing harmful interference to the radio astronomy service in the band 25 550-25 670 shall be avoided. The use of passive sensors by other services will also be authorized.

547-In making assignments to stations of other services to which the band 37.5-38.25 is allocated, administrations are urged to take all practicable steps to protect the radio astronomy service from harmful interference. Emissions from space or airborne stations can be particularly serious sources of interference to the radio astronomy service (see Nos. 343 and 344 and Article 36).

568-In making assignments to stations of other services to which the band 73-74.6 MHz is allocated, administrations are urged to take all practicable steps to protect the radio astronomy service from harmful interference. Emissions from space or airborne stations can be particularly serious sources of interference to the radio astronomy service (see Nos. 343 and 344 and Article 36).

570-Additional allocation: in Columbia, Costa Rica, Cuba, El Salvador, Ecuador, Guatemala, Guayana, HonduRA, and Nicaragua, the band 73-74.6 MHz is also allocated to the fixed and mobile services on a secondary basis.

577-In Region 3 (except in the Republic of Korea, India, Japan, Malaysia, the Philippines, Singapore and Thailand), the band 79.75-80.25 MHz is also allocated to the radio astronomy service on a primary basis. In making assignments to stations of other services, administrations

are urged to take all practicable steps in the band to protect the radio astronomy service from harmful interference. Emissions from space or airborne stations can be particularly serious sources of interference to the radio astronomy service (see Nos. 343 and 344 and Article 36).

610-In making assignments to stations of other services to which the band 150.05-153 MHz is allocated, administrations are urged to take all practicable steps to protect the radio astronomy service from harmful interference. Emissions from space or airborne stations can be particularly serious sources of interference to the radio astronomy service (see Nos. 343 and 344 and Article 36).

611-Additional allocation: in Australia and India, the band 150.05-153 MHz is also allocated to the radio astronomy service on a primary basis.

637- Additional allocation: in China, the band 225-235 MHz is also allocated to the radio astronomy service on a secondary basis.

644-In making assignments to stations of other services to which the band 322-328.6 MHz is allocated, administrations are urged to take all practicable steps to protect the radio astronomy service from harmful interference. Emissions from space or airborne stations can be particularly serious sources of interference to the radio astronomy service (see Nos. 343 and 344 and Article 36).

650-In making assignments to stations of other services to which the band 406.1-410 MHz is allocated, administrations are urged to take all practicable steps to protect the radio astronomy service from harmful interference. Emissions from space or airborne stations can be particularly serious sources of interference to the radio astronomy service (see Nos. 343 and 344 and Article 36).

713-In the band 1215-1300 MHz, 3100-3300 MHz, 5250-5350 MHz, 8550-8650 MHz, 9500-9800 MHz and 13.4-14.0 GHz, radiolocation stations installed on spacecraft may also be employed for the earth exploration-satellite and space research services on a secondary basis.

714-Additional allocation: in Canada and the United States, the bands 1240-1300 MHz and 1350-1370 MHz are also allocated to the aeronautical radionavigation service on a primary basis.

717-The use of the bands 1300-1350 MHz, 2700-2900 MHz, and 9000-9200 MHz by the aeronautical radionavigation service is restricted to ground-based radars and to the associated airborne transponders which transmit only on frequencies in these bands and only when actuated by radars operating in the same band.

718-In making assignments to stations of other services, administrations are urged to take all practicable steps to protect the spectral line observations of the radio astronomy service from harmful interference in the band 1 330-1 400 MHz. Emissions from space or airborne stations

can be particularly serious sources of interference to the radio astronomy service (see Nos. 343 and 344 and Article 36).

720-The bands 1 370-1 400 MHz, 2 640-2 655 MHz, 4 950-4 990 MHz and 15.20-15.35 GHz are also allocated to the space research (passive) and earth exploration-satellite (passive) services on a secondary basis.

721-All emissions in the band 1 400-1 427 MHz are prohibited.

722-In the bands 1 400-1 727 MHz, 101-120 GHz and 197-220 GHz, passive research is being conducted in some countries in a programme for the search for intentional emissions of extra-terrestrial origin.

726A-The bands 1525-1544 MHz, 1545-1559 MHz, 1626.5-1645.5 MHz and 1646.5-1660.5 MHz shall not be used for feeder links of any service. In exceptional circumstances, however, an earth station at a specific fixed point in any of the mobile-satellite services may be authorized by an administration to communicate via space station using these bands.

732-The band 1 610-1 626.5 MHz is reserved on a worldwide basis for the use and development of airborne electronic aids to air navigation and any directly associated ground-based or satellite-borne facilities. Such satellite use is subject to agreement obtained under the procedure set forth in Article 14.

733-The bands 1 610-1 626.5 MHz, 5 000-5 250 MHz and 15.4-15.7 GHz are also allocated to the aeronautical mobile-satellite (R) service on a primary basis. Such use is subject to agreement obtained under the procedure set forth in Article 14.

734-In making assigments to station of other services, administrations are urged to take all practicable steps to protect the radio astronomy service in the band 1610.6-1613.9 MHz from harmful interference. Emissions from space or airborne stations can be particularly serious sources of interference to the radio astronomy service (see Nos. 343 and 344 and Article 36).

736-In making assignments to stations of other services to which the band 1660-1670 MHz is allocated, administrations are urged to take all practicable steps to protect the radio astronomy service from harmful interference. Emissions from space or airborne stations can be particularly serious sources of interference to the radio astronomy service (see Nos. 343 and 344 and Article 36).

739-In view of the successful detection by radio astronomers of two hydroxyl spectral lines in the region of 1 665 and 1 667 MHz, administrations are urged to give all practicable protection in the band 1 660.5-1 668.4 MHz for future research in radio astronomy, particularly by eliminating air-to-ground transmissions in the meteorological aids service in the band 1 664.4-1 668.4 MHz as soon as possible.

744-The band 1 718.8-1 722.2 MHz is also allocated to the radio astronomy service on a secondary basis for spectral line observations. In making assignments to stations of other services to which the band is allocated, administrations are urged to take all practicable steps to protect the radio astronomy service from harmful interference. Emissions from space or airborne stations can be particularly serious sources interference to the radio astronomy service (see Nos. 343 and 344 and Article 36).

750-Subject to agreement obtained under the procedure set forth in Article 14, the band 2 200-2 290 MHz may also be used for space-to-Earth and space-to-space transmissions in the space research, space operations and earth exploration-satellite services. These services shall operate in accordance with the provisions of Nos. 2557 to 2560; the space-to-space transmissions shall not cause harmful interference to the other space services.

760-In the design of systems in the broadcasting-satellite service in the bands between 2 500 and 2 690 MHz, administrations are urged to take all practicable steps to protect the radio astronomy service in the band 2 690-2 700 MHz.

765-In making assignments to stations of other services, administrations are urged to take all practicable steps to protect the radio astronomy service from harmful interference in the band 2 655-2 690 MHz. Emissions from space or airborne stations can be particularly serious sources of interference to the radio astronomy service (see Nos. 343 and 344 and Article 36).

778-In making assignments to stations of other services, administrations are urged to take all practicable steps to protect the spectral line observations of the radio astronomy service from harmful interference in the bands 3 260-3 267 MHz, 3 332-3 339 MHz, 3 345.8-3 352.5 MHz and 4 825-4 835 MHz. Emissions from space or airborne stations can be particularly serious sources of interference to the radio astronomy service (see Nos. 343 and 344 and Article 36).

793-In the bands 4 825-4 835 MHz and 4 950-4 990 MHz, the allocation to the mobile service is restricted to the mobile, except aeronautical mobile, service.

794-Different category of service: in Argentinam Australia, and Canada, the allocation of the bands 4 825-4 835 MHz and 4 950-4 990 MHz to the radio astronomy service is on a primary basis (see No. 425). In making assignments to stations of other services to which these bands are allocated, administrations are urged to take all practicable steps to protect the radio astronomy service from harmful interference. Emissions from space or airborne stations can be particularly serious sources of interference to the radio astronomy service (see Nos. 343 and 344 and Article 36).

795-In making assignments to stations of other services to which the band 4 990-5 000 MHz is allocated, administrations are urged to take all practicable steps to protect the radio astronomy service from harmful interference. Emissions from space or airborne stations can be particularly serious sources of interference to the radio astronomy service (see Nos. 343 and 344 and Article

36).

796-The band 5 000-5 250 MHz is to be used for the operation of the international standard system (microwave landing system) for precision approach and landing. The requirements of this system shall take precedence over other uses of this band.

797-The bands 5 000-5 250 MHz and 15.4-15.7 GHz are also allocated to the fixed-satellite service and the inter-satellite service, for connection between one or more earth stations at specified fixed points on the Earth and space stations, when these services are used in conjunction with the aeronautical radionavigation and/or aeronautical mobile (R) service. Such use shall be subject to agreement obtained under the procedure set forth in Article 14.

814-In Region 2, aircraft stations are not permitted to transmit in the band 8 025-8 400 MHz.

816-In the space research service the use of the band 8 400-8 500 MHz is limited to deep space.

817-Different category of service: in Belgium, Israel, Luxembourg, Malaysia, Singapore, and Sri Lanka, the allocation of the band 8 400-8 500 MHz to the space research service is on a secondary basis (see No. 424).

818-Alternative allocation: in the United Kingdom, the band 8 400-8 500 MHz is allocated to the radiolocation and the space research services on a primary basis.

831-In the band 10.6-10.68 GHz, stations of the fixed and mobile, except aeronautical mobile, services shall be limited to a maximum equivalent isotropically radiated power of 40 dBW and the power delivered to the antenna shall not exceed -3 dBW. These limits may be exceeded subject to agreement obtained under the procedure set forth in Article 14. However, in Afghanistan, Saudi Arabia, Bahrain, Bangladesh, China, the United Arab Emirates, Finland, India, Indonesia, Iran, Iraq, Japan, Kuwait, the Lebanon, Nigeria, Pakistan, the Philippines, Qatar, Syria and the U.S.S.R., the restrictions on the fixed and mobile, except aeronautical mobile, services are not applicable.

832-In making assignments to stations of other services to which the band 10.6-10.68 GHz is allocated, administrations are urged to take all practicable steps to protect the radio astronomy service from harmful interference. Emissions from space or airborne stations can be particularly serious sources of interference to the radio astronomy service (see Nos. 343 and 344 and Article 36).

833-All emissions in the band 10.68-10.7 GHz are prohibited, except for those provided by No. 834.

834-Additional allocation: in Saudi Arabia, Bahrain, Bulgaria, Cameroon, China, Columbia, the Republic of Korea, Costa Rica, Cuba, Egypt, the United Arab Emirates, Ecuador, Hungary, Iran,

Iraq, Israel, Japan, Kuwait, the Lebanon, Mongolia, Pakistan, Poland, Qatar, the German Democratic Republic, Roumania, Czechoslovakia, the U.S.S.R. and Yugoslavia, the band 10.68-10.7 GHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. Such use is limited to equipment in operation by 1 January 1985.

862-In making assignments to stations of other services to which the band 14.47-14.5 GHz is allocated, administrations are urged to take all practicable steps to protect spectral line observations of the radio astronomy service from harmful interference. Emissions from space or airborne stations can be particularly serious sources of interference to the radio astronomy service (see Nos. 343 and 344 and Article 36).

864-All emissions in the band 15.35-15.4 GHz are prohibited, except those provided for by No. 865.

865-Additional allocation: in Afghanistan, Saudi Arabia, Bahrain, Cameroon, Egypt, the United Arab Emirates, Guinea, Iran, Iraq, Israel, Kuwait, the Lebanon, Libya, Pakistan, Qatar, Syria, Somalia and Yugoslavia, the band 15.35-15.4 GHz is also allocated to the fixed and mobile services on a secondary basis.

874-In making assignments to stations of other services, administrations are urged to take all practicable steps to protect the spectral line observations of the radio astronomy service in the band 22.01-22.21 GHz from harmful interference. Emissions from space or airborne stations can be particularly serious sources interference to the radio astronomy service (see Nos. 343 and 344 and Article 36).

875-In making assignments to stations of other services, administrations are urged to take all practicable steps to protect the radio astronomy service from harmful interference in the band 22.21-22.25 GHz. Emissions from space or airborne stations can be particularly serious sources of interference to the radio astronomy service (see Nos. 343 and 344 and Article 36).

879-In making assignments to stations of other services, administrations are urged to take all practicable steps to protect the spectral line observations of the radio astronomy service in the bands 22.81-22.86 GHz and 23.07-23.12 GHz from harmful interference. Emissions from space or airborne stations can be particularly serious sources of interference to the radio astronomy service (see Nos. 343 and 344 and Article 36).

880-All emissions in the band 23.6-24 GHz are prohibited.

886-In making assignments to stations of other services, administrations are urged to take all practicable steps to protect the radio astronomy service from harmful interference in the band 31.2-31.3 GHz. Emissions from space or airborne stations can be particularly serious sources of interference to the radio astronomy service (see Nos. 343 and 344 and Article 36).

887-All emissions in the band 31.3-31.5 GHz are prohibited.

888-In Regions 1 and 3, in making assignments to stations of other services to which the band 31.5-31.8 GHz is allocated, administrations are urged to take all practicable steps to protect the radio astronomy service from harmful interference. Emissions from space or airborne stations can be particularly serious sources of interference to the radio astronomy service (see Nos. 343 and 344 and Article 36). In Region 2, all emissions in the band 31.5-31.8 GHz are prohibited.

889-Different category of service: in Bulgaria, Egypt, Hungary, Mongolia, Poland, the German Democratic Republic, Czechoslovakia and the U.S.S.R., the allocation of the band 31.5-31.8 GHz to the fixed and mobile, except aeronautical mobile, services is on a primary basis (see No. 425).

898-In making assignments to stations of other services, administrations are urged to take all practicable steps to protect the spectral line observations of the radio astronomy service in the band 36.43-36.5 GHz from harmful interference. Emissions from space or airborne stations can be particularly serious sources of interference to the radio astronomy service (see Nos. 343 and 344 and Article 36).

900-In making assignments to stations of other services to which the band 42.5-43.5 GHz is allocated, administrations are urged to take all practicable steps to protect spectral line observations of the radio astronomy service from harmful interference, especially in the bands 42.77-42.87 GHz, 43.07-43.17 GHz, and 43.37-43.47 GHz, which are used for spectral line observations of silicon monoxide. Emissions from space or airborne stations can be particularly serious sources of interference to the radio astronomy service (see Nos. 343 and 344 and Article 36).

902-In the bands 43.5-47 GHz, 66-71 GHz, 95-100 GHz, 134-142 GHz, 190-200 GHz and 252-265 GHz, stations in the land mobile service may be operated subject to not causing harmful interference to the space radiocommunication services to which these bands are allocated (see No. 435).

903-In the bands 43.5-47 GHz, 66-71 GHz, 95-100 GHz, 134-142 GHz, 190-200 GHz and 252-265 GHz, satellite links connecting land stations at specified fixed points are also authorized when used in conjunction with the mobile-satellite service or the radionavigation-satellite service.

904-The bands 48.94-49.04 GHz and 97.88-98.08 GHz are allocated to the radio astronomy service on a primary basis for spectral line observations. In making assignments to stations of other services to which these bands are allocated, administrations are urged to take all practicable steps to protect the radio astronomy service from harmful interference. Emissions from space or airborne stations can be particularly serious sources of interference to the radio astronomy service (see Nos. 343 and 344 and Article 36).

905-In the band 48.94-49.04 GHz, all emissions from airborne stations are prohibited.

906-In the bands 51.4-54.25 GHz, 58.2-59 GHz, 64-65 GHz and 72.77-72.91 GHz, radio astronomy observations may be carried out under national arrangements. Administrations are urged to take all practicable steps to protect radio astronomy observations in these bands from harmful interference.

907-In the bands 51.4-54.25 GHz, 58.2-59 GHz, 64-65 GHz, 86-92 GHz, 105-116 GHz and 217-231 GHz, all emissions are prohibited.

909-In the bands 54.25-58.2 GHz, 59-64 GHz, 116-134 GHz, 170-182 GHz and 185-190 GHz, stations in the aeronautical mobile service may be operated subject to not causing harmful interference to the inter-satellite service (see No. 435).

914-The band 93.07-93.27 GHz is also used by the radio astronomy service for spectral line observations. In making assignments to stations of services to which this band is allocated, administrations are urged to take all practicable steps to protect radio astronomy observations from harmful interference. Emissions from space or airborne stations can be particularly serious sources of interference to the radio astronomy service (see Nos. 343 and 344 and Article 36).

915-The band 119.98-120.02 GHz is also allocated to the amateur service on a secondary basis.

916-The band 122-123 GHz (center frequency 122.5 GHz) is designed for industrial, scientific and medical (ISM) applications. The use of this frequency band for ISM applications shall be subject to special authorization by the administration concerned in agreement with other administrations whose radiocommunication services might be affected. In applying this provision administrations shall have due regard to the latest relevant CCIR Recommendations.

917-In the band 140.69-140.98 GHz all emissions from airborne stations, and from space stations in the space-Earth direction, are prohibited.

918-The bands 140.69-140.98 GHz, 144.68-144.98 GHz, 145.45-145.75 and 146.82-147.12 GHz are also allocated to the radio astronomy service on a primary basis for spectral line observations. In making assignments to stations of other services to which the bands are allocated, administrations are urged to take all practicable steps to protect the radio astronomy service from harmful interference. Emissions from space or airborne stations can be particularly serious sources of interference to the radio astronomy service (see Nos. 343 and 344 and Article 36).

919-The bands 150-151 GHz, 174.42-175.02 GHz, 177-177.4 GHz, 178.2-178.6 GHz, 181-181.46 GHz and 186.2-186.6 GHz are also allocated to the radio astronomy service on a secondary basis for spectral line observations. In making assignments to stations of other services to which these bands are allocated, administrations are urged to take all practicable steps to protect the radio astronomy service from harmful interference. Emissions from space or

airborne stations can be particularly sources of interference to the radio astronomy service (see Nos. 343 and 344 and Article 36).

920-Additional allocation: in the United Kingdom, the band 182-185 GHz is also allocated to the fixed and mobile services on a primary basis.

921-In the band 182-185 GHz all emissions are prohibited except for those under the provisions of No. 920.

923-The bands 250-251 GHz and 262.24-262.76 GHz are also allocated to the radio astronomy service on a primary basis for spectral line observations. In making assignments to stations of other services to which the bands are allocated, administrations are urged to take all practicable steps to protect the radio astronomy service from harmful interference. Emissions from space or airborne stations can be particularly serious sources of interference to the radio astronomy service (see Nos. 343 and 344 and Article 36).

924-The band 257.5-258 GHz is also allocated to the radio astronomy service on a secondary basis for spectral line observations. In making assignments to stations of other services to which the band is allocated, administrations are urged to take all practicable steps to protect the radio astronomy service from harmful interference. Emissions from space or airborne stations can be particularly serious sources of interference to the radio astronomy service (see Nos. 343 and 344 and Article 36).

925-In the Federal Republic of Germany, Argentina, Spain, Finland, France, India, Italy, the Netherlands, and Sweden, the band 261-265 GHz is also allocated to the radio astronomy service on a primary basis. In making assignments to stations of other services to which the band is allocated, administrations are urged to take all practicable steps to protect the radio astronomy service from harmful interference. Emissions from space or airborne stations can be particularly serious sources of interference to the radio astronomy service (see Nos. 343 and 344 and Article 36).

926-In making assignments to stations of other services to which the band 265-275 GHz is allocated, administrations are urged to take all practicable steps to protect the radio astronomy service from harmful interference, especially in the bands 265.64-266.16 GHz, 267.34-267.86 GHz and 271.74-272.26 GHz, which are used for spectral line observations. Emissions from space or airborne stations can be particularly serious sources of interference to the radio astronomy service (see Nos. 343 and 344 and Article 36).

927-The frequency band 275-400 GHz may be used by administrations for experimentation with, and development of, various active and passive services. In this band a need has been identified for the following spectral line measurements for passive services:

radio astronomy service:
278-280 GHz and 343-348 GHz;

space research service (passive) and earth exploration-satellite service (passive):
275-277 GHz, 300-302 GHz, 324-326 GHz, 345-347 GHz, 363-365 GHz and 379-381 GHz.

Future research in this largely unexplored spectral region may yield additional spectral lines and continuum bands of interest to the passive services. Administrations are urged to take all practicable steps to protect these passive services from harmful interference until the next competent world administrative radio conference.