and without regard to the duration of time involved, continue to serve in said proceeding until the final disposition thereof, including hearings and conferences after any order or reopening, provided that he shall continue to be a State commissioner.

(c) No member of a cooperating committee shall have any right or authority to designate another commissioner to serve in his place at any hearing or conference in any proceeding in which he has been appointed to serve.

(d) Should a vacancy occur upon any cooperating committee, in a proceeding involving more than eight States, by reason of the death of any cooperating commissioner, or of his ceasing to be a State commissioner, or of other inability to serve, it shall be the duty of the president of the association to fill the vacancy by appointment, if, after communication with the chairman of the cooperating committee, it be deemed necessary to fill such vacancy.

(e) In the event of any such vacancy occurring upon a cooperating committee involving not more than eight States, the vacancy shall be filled by the commission from which the vacancy occurs.

COOPERATING COMMITTEE TO DETERMINE RESPECTING ANY REPORT OF STATEMENT OF ITS ATTITUDE

(a) Whenever a cooperating committee shall have concluded its work, or shall deem such course advisable, the committee shall consider whether it is necessary and desirable to make a report to the interested State commissions, and, if it shall determine to make a report, it shall cause the same to be distributed through the secretary of the association, or through the general solicitor to all interested commissions.

(b) If a report of the Federal Commission will accompany any order to be made in said proceeding, the Federal Commission will state therein the concurrence or nonconcurrence of said cooperating committee in the decision or order of said Federal Commission.

CONSTRUCTION HEREOF IN CERTAIN RESPECTS EXPRESSLY PROVIDED

It is understood and provided that no State or States shall be deprived of the right of participation and cooperation as hereinbefore provided because of nonmembership in the association. With respect to any such State or States, all negotiations herein specified to be carried on between the Federal Commission and any officer of such association shall be conducted by the Federal Commission directly with the chairman of the commission of such State or States.

[28 FR 12462, Nov. 22, 1963, as amended at 29 FR 4801, Apr. 4, 1964]

PART 2—FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS

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AUTHORITY: Sec. 4, 302, 303, and 307 of the Communications Act of 1934, as amended, 47 U.S.C. Sections 154, 302, 303 and 307, unless otherwise noted.

SOURCE: 28 FR 12465, Nov. 22, 1963, unless otherwise noted.

Subpart A—Terminology

§2.1 Terms and definitions.

(a) Where a term or definition appears in this part of the Commission's Rules, it shall be the definitive term or definition and shall prevail throughout the Commission's Rules.

(b) The source of each definition is indicated as follows:

CONV—*International Telecommunication Convention*, Malaga-Torremolinos, 1973.

RR—*Radio Regulations*, Geneva, 1982.

FCC—Federal Communications Commission.

(c) The following terms and definitions are issued:

Accepted Interference.[1] Interference at a higher level than defined as permissible interference and which has been agreed upon between two or more administrations without prejudice to other administrations. (RR)

Active Satellite. A satellite carrying a station intended to transmit or retransmit radiocommunication signals. (RR)

Active Sensor. A measuring instrument in the earth exploration-satellite service or in the space research service by means of which information is obtained by transmission and reception of radio waves. (RR)

Administration. Any governmental department or service responsible for discharging the obligations undertaken in the Convention of the International Telecommunication Union and the Regulations. (CONV)

Aeronautical Earth Station. An Earth station in the fixed-satellite service, or, in some cases, in the aeronautical mobile-satellite service, located at a specified fixed point on land to provide a feeder link for the aeronautical mobile-satellite service. (RR)

Aeronautical Fixed Service. A radiocommunication service between specified fixed points provided primarily for the safety of air navigation and for the regular, efficient and economical operation of air transport. (RR)

Aeronautical Fixed Station. A station in the aeronautical fixed service. (RR)

Aeronautical Mobile Off-Route (OR) Service. An aeronautical mobile service intended for communications, including those relating to flight coordination, primarily outside national or international civil air routes. (RR)

Aeronautical Mobile Route (R) Service. An aeronautical mobile service reserved for communications relating to safety and regularity of flight, primarily along national or international civil air routes. (RR)

Aeronautical Mobile-Satellite Off-Route (OR) Service. An aeronautical mobile-satellite service intended for communications, including those relating to flight coordination, primarily outside national and international civil air routes. (RR)

Aeronautical Mobile-Satellite Route (R) Service. An aeronautical mobile-satellite service reserved for communications relating to safety and regularity of flights, primarily along national or international civil air routes. (RR)

Aeronautical Mobile-Satellite Service. A mobile-satellite service in which mobile earth stations are located on board aircraft; survival craft stations and emergency position-indicating radiobeacon stations may also participate in this service. (RR)

Aeronautical Mobile Service. A mobile service between aeronautical stations and aircraft stations, or between aircraft stations, in which survival craft stations may participate; emergency position-indicating radiobeacon stations may also participate in this service on designated distress and emergency frequencies. (RR)

Aeronautical Radionavigation-Satellite Service. A radionavigation-satellite service in which earth stations are located on board aircraft. (RR)

Aeronautical Radionavigation Service. A radio-navigation service intended for the benefit and for the safe operation of aircraft. (RR)

Aeronautical Station. A land station in the aeronautical mobile service.

NOTE: In certain instances, an aeronautical station may be located, for example, on board ship or on a platform at sea. (RR)

Aircraft Earth Station. A mobile earth station in the aeronautical mobile-satellite service located on board an aircraft. (RR)

Aircraft Station. A mobile station in the aeronautical mobile service, other than a survival craft station, located on board an aircraft. (RR)

Allocation (of a frequency band). Entry in the Table of Frequency Allocations of a given frequency band for the purpose of its use by one or more terrestrial or space radiocommunication services or the radio astronomy service under specified conditions. This term shall also be applied to the frequency band concerned. (RR)

Allotment (of a radio frequency or radio frequency channel). Entry of a designated frequency channel in an agreed

[1] The terms *permissible interference* and *accepted interference* are used in the coordination of frequency assignments between administrations.

plan, adopted by a competent conference, for use by one or more administrations for a terrestrial or space radiocommunication service in one or more identified countries or geographical area and under specified conditions. (RR)

Altitude of the Apogee or Perigee. The altitude of the apogee or perigee above a specified reference surface serving to represent the surface of the Earth. (RR)

Amateur-Satellite Service. A radiocommunication service using space stations on earth satellites for the same purposes as those of the amateur service. (RR)

Amateur Service. A radiocommunication service for the purpose of self-training, intercommunication and technical investigations carried out by amateurs, that is, by duly authorized persons interested in radio technique solely with a personal aim and without pecuniary interest. (RR)

Amateur Station. A station in the amateur service. (RR)

Assigned Frequency. The centre of the frequency band assigned to a station. (RR)

Assigned Frequency Band. The frequency band within which the emission of a station is authorized; the width of the band equals the necessary bandwidth plus twice the absolute value of the frequency tolerance. Where space stations are concerned, the assigned frequency band includes twice the maximum Doppler shift that may occur in relation to any point of the Earth's surface. (RR)

Assignment (of a radio frequency or radio frequency channel). Authorization given by an administration for a radio station to use a radio frequency or radio frequency channel under specified conditions. (RR)

Base Earth Station. An earth station in the fixed-satellite service or, in some cases, in the land mobile-satellite service, located at a specified fixed point or within a specified area on land to provide a feeder link for the land mobile-satellite service. (RR)

Base Station. A land station in the land mobile service. (RR)

Broadcasting-Satellite Service. A radiocommunication service in which signals transmitted or retransmitted by space stations are intended for direct reception by the general public.

NOTE: In the broadcasting-satellite service, the term *direct reception* shall encompass both individual reception and community reception. (RR)

Broadcasting Service. A radiocommunication service in which the transmissions are intended for direct reception by the general public. This service may include sound transmissions, television transmissions or other types of transmission. (CONV)

Broadcasting Station. A station in the broadcasting service. (RR)

Carrier Power (of a radio transmitter). The average power supplied to the antenna transmission line by a transmitter during one radio frequency cycle taken under the condition of no modulation. (RR)

Characteristic Frequency. A frequency which can be easily identified and measured in a given emission.

NOTE: A carrier frequency may, for example, be designated as the characteristic frequency. (RR)

Class of Emission. The set of characteristics of an emission, designated by standard symbols, e.g., type of modulation, modulating signal, type of information to be transmitted, and also if appropriate, any additional signal characteristics. (RR)

Coast Earth Station. An earth station in the fixed-satellite service or, in some cases, in the maritime mobile-satellite service, located at a specified fixed point on land to provide a feeder link for the maritime mobile-satellite service. (RR)

Coast Station. A land station in the maritime mobile service. (RR)

Community Reception (in the broadcasting-satellite service). The reception of emissions from a space station in the broadcasting-satellite service by receiving equipment, which in some cases may be complex and have antennae larger than those for individual reception, and intended for use: (1) by a group of the general public at one location; or (2) through a distribution system covering a limited area. (RR)

Coordinated Universal Time (UTC). Time scale, based on the second (SI), as defined and recommended by the

CCIR,[2] and maintained by the Bureau International de l'Heure (BIH).

NOTE: For most practical purposes associated with the Radio Regulations, UTC is equivalent to mean solar time at the prime meridian (0 degrees longitude), formerly expressed in GMT. (RR)

Coordination Area. The area associated with an earth station outside of which a terrestrial station sharing the same frequency band neither causes nor is subject to interfering emissions greater than a permissible level. (RR)

Coordination Contour. The line enclosing the coordination area. (RR)

Coordination Distance. Distance on a given azimuth from an earth station beyond which a terrestrial causes nor is subject to interfering emissions greater than a permissible level. (RR)

Deep Space. Space at distance from the Earth equal to, or greater than, 2×10^6 kilometers. (RR)

Direct Sequence Systems. A direct sequence system is a spread spectrum system in which the incoming information is usually digitized, if it is not already in a binary format, and modulo 2 added to a higher speed code sequence. The combined information and code are then used to modulate a RF carrier. Since the high speed code sequence dominates the modulating function, it is the direct cause of the wide spreading of the transmitted signal.

Duplex Operation. Operating method in which transmission is possible simultaneously in both directions of a telecommunication channel.[3] (RR)

Earth Exploration-Satellite Service. A radiocommunication service between earth stations and one or more space stations, which may include links between space stations in which:

(1) Information relating to the characteristics of the Earth and its natural phenomena is obtained from active sensors or passive sensors on earth satellites;

(2) Similar information is collected from air-borne or earth-based platforms;

(3) Such information may be distributed to earth stations within the system concerned;

(4) Platform interrogation may be included.

NOTE: This service may also include feeder links necesary for its operation. (RR)

Earth Station. A station located either on the earth's surface or within the major portion of earth's atmosphere and intended for communication:

(1) With one or more space stations; or

(2) With one or more stations of the same kind by means of one or more reflecting satellites or other objects in space. (RR)

Effective Radiated Power (e.r.p) (in a given direction). The product of the power supplied to the antenna and its gain relative to a half-wave dipole in a given direction. (RR)

Emergency Position-Indicating Radiobeacon Station. A station in the mobile service the emissions of which are intended to facilitate search and rescue operations. (RR)

Emission. Radiation produced, or the production of radiation, by a radio transmitting station.

NOTE: For example, the energy radiated by the local oscillator of a radio receiver would not be an emission but a radiation. (RR)

Equivalent Isotropically Radiated Power (e.i.r.p.). The product of the power suppled to the antenna and the antenna gain in a given direction relative to an isotropic antenna. (RR)

Equivalent Monopole Radiated Power (e.m.r.p.) (in a given direction). The product of the power supplied to the antenna and its gain relative to a short vertical antenna in a given direction. (RR)

Equivalent Satellite Link Noise Temperature. The noise temperature referred to the output of the receiving antenna of the earth station corresponding to the radio-frequency noise power which produces the total observed noise at the output of the satellite link excluding the noise due to interference coming from satellite links using other satellites and from terrestrial systems. (RR)

Experimental Station. A station utilizing radio waves in experiments with a

[2] The full definition is contained in CCIR Recommendation 460–2.

[3] In general, duplex operation and semi-duplex operation require two frequencies in radiocommunication; simplex operation may use either one or two.

view to the development of science or technique.

NOTE: This definition does not include amateur stations. (RR)

Facsimile. A form of telegraphy for the transmission of fixed images, with or without half-tones, with a view to their reproduction in a permanent form.

NOTE: In this definition the term *telegraphy* has the same general meaning as defined in the Convention. (RR)

Feeder Link. A radio link from an earth station at a given location to a space station, or vice versa, conveying information for a space radiocommunication service other than for the fixed-satellite service. The given location may be at a specified fixed point, or at any fixed point within specified areas. (RR)

Fixed-Satellite Service. A radiocommunication service between earth stations at given positions, when one or more satellites are used; the given position may be a specified fixed point or any fixed point within specified areas; in some cases this service includes satellite-to-satellite links, which may also be operated in the inter-satellite service; the fixed-satellite service may also include feeder links for other space radiocommunication services. (RR)

Fixed Service. A radiocommunication service between specified fixed points. (RR)

Fixed Station. A station in the fixed service. (RR)

Frequency-Shift Telegraphy. Telegraphy by frequency modulation in which the telegraph signal shifts the frequency of the carrier between predetermined values. (RR)

Frequency Tolerance. The maximum permissible departure by the centre frequency of the frequency band occupied by an emission from the assigned frequency or, by the characteristic frequency of an emission from the reference frequency.

NOTE: The frequency tolerance is expressed in parts in 10^6 or in hertz. (RR)

Full Carrier Single-Sideband Emission. A single-sideband emission without suppression of the carrier. (RR)

Frequency Hopping Systems. A frequency hopping system is a spread spectrum system in which the carrier is modulated with the coded information in a conventional manner causing a conventional spreading of the RF energy about the carrier frequency. However, the frequency of the carrier is not fixed but changes at fixed intervals under the direction of a pseudorandom coded sequence. The wide RF bandwidth needed by such a system is not required by a spreading of the RF energy about the carrier but rather to accommodate the range of frequencies to which the carrier frequency can hop.

Gain of an Antenna. The ratio, usually expressed in decibels, of the power required at the input of a loss free reference antenna to the power supplied to the input of the given antenna to produce, in a given direction, the same field strength or the same power flux-density at the same distance. When not specified otherwise, the gain refers to the direction of maximum radiation. The gain may be considered for a specified polarization.

NOTE: Depending on the choice of the reference antenna a distinction is made between:

(1) Absolute or isotropic gain (Gi), when the reference antenna is an isotropic antenna isolated in space;

(2) Gain relative to a half-wave dipole (Gd), when the reference antenna is a half-wave dipole isolated in space whose equatorial plane contains the given direction;

(3) Gain relative to a short vertical antenna (Gv), when the reference antenna is a linear conductor, much shorter than one quarter of the wavelength, normal to the surface of a perfectly conducting plane which contains the given direction. (RR)

General Purpose Mobile Service. A mobile service that includes all mobile communications uses including those within the Aeronautical Mobile, Land Mobile, or the Maritime Mobile Services.

Geostationary Satellite. A geosynchronous satellite whose circular and direct orbit lies in the plane of the Earth's equator and which thus remains fixed relative to the Earth; by extension, a satellite which remains approximately fixed relative to the Earth. (RR)

Geostationary Satellite Orbit. The orbit in which a satellite must be placed to be a geostationary satellite. (RR)

Geosynchronous Satellite. An Earth satellite whose period of revolution is equal to the period of rotation of the Earth about its axis. (RR)

Harmful Interference[4]. Interference which endangers the functioning of a radionavigation service or of other safety services or seriously degrades, obstructs, or repeatedly interrupts a radiocommunication service operating in accordance with these [international] Radio Regulations. (RR)

Hybrid Spread Spectrum Systems. Hybrid spread spectrum systems are those which use combinations of two or more types of direct sequence, frequency hopping, time hopping and pulsed FM modulation in order to achieve their wide occupied bandwidths.

Inclination of an Orbit (of an earth satellite). The angle determined by the plane containing the orbit and the plane of the Earth's equator. (RR)

Individual Reception (in the broadcasting-satellite service). The reception of emissions from a space station in the broadcasting-satellite service by simple domestic installations and in particular those possessing small antennae. (RR)

Industrial, Scientific and Medical (ISM) (of radio frequency energy) Applications. Operation of equipment or appliances designed to generate and use locally radio-frequency energy for industrial, scientific, medical, domestic or similar purposes, excluding applications in the field of telecommunications. (RR)

Instrument Landing System (ILS). A radionavigation system which provides aircraft with horizontal and vertical guidance just before and during landing and, at certain fixed points, indicates the distance to the reference point of landing. (RR)

Instrument Landing System Glide Path. A system of vertical guidance embodied in the instrument landing system which indicates the vertical deviation of the aircraft from its optimum path of descent. (RR)

Instrument Landing System Localizer. A system of horizontal guidance embodied in the instrument landing system which indicates the horizontal deviation of the aircraft from its optimum path of descent along the axis of the runway. (RR)

Interference. The effect of unwanted energy due to one or a combination of emissions, radiations, or inductions upon reception in a radiocommunication system, manifested by any performance degradation, misinterpretation, or loss of information which could be extracted in the absence of such unwanted energy. (RR)

Inter-Satellite Service. A radiocommunication service providing links between artificial earth satellites. (RR)

Ionospheric Scatter. The propagation of radio waves by scattering as a result of irregularities or discontinuities in the ionization of the ionosphere. (RR)

Land Earth Station. An earth station in the fixed-satellite service or, in some cases, in the mobile-satellite service, located at a specified fixed point or within a specified area on land to provide a feeder link for the mobile-satellite service. (RR)

Land Mobile Earth Station. A mobile earth station in the land mobile-satellite service capable of surface movement within the geographical limits of a country or continent. (RR)

Land Mobile-Satellite Service. A mobile-satellite service in which mobile earth stations are located on land. (RR)

Land Mobile Service. A mobile service between base stations and land mobile stations, or between land mobile stations. (RR)

Land Mobile Station. A mobile station in the land mobile service capable of surface movement within the geographical limits of a country or continent.

Land Station. A station in the mobile service not intended to be used while in motion. (RR)

Left-Hand (or Anti-Clockwise) Polarized Wave. An elliptically or circularly-polarized wave, in fixed plane, normal to the direction of propagation, whilst looking in the direction of propagation, rotates with time in a left hand or anti-clockwise direction. (RR)

Line A. Begins at Aberdeen, Washington running by great circle arc to the intersection of 48° N., 120° W., thence along parallel 48° N., to the intersection of 95° W., thence by great circle

[4] See Resolution 68 of the *Radio Regulations.*

arc through the southernmost point of Duluth, Minn., thence by great circle arc to 45° N., 85° W., thence southward along meridian 85° W., to its intersection with parallel 41° N., thence along parallel 41° N., to its intersection with meridian 82° W., thence by great circle arc through the southernmost point of Bangor, Maine, thence by great circle arc through the southernmost point of Searsport, Maine, at which point it terminates. (FCC)

Line B. Begins at Tofino, B.C., running by great circle arc to the intersection of 50° N., 125° W., thence along parallel 50° N., to the intersection of 90° W., thence by great circle arc to the intersection of 45° N., 79°30′ W., thence by great circle arc through the northernmost point of Drummondville, Quebec (Lat. 45°52′ N., Long 72°30′ W.), thence by great circle arc to 48°30′ N., 70° W., thence by great circle arc through the northernmost point of Compbellton, N.B., thence by great circle are through the northernmost point of Liverpool, N.S., at which point it terminates. (FCC)

Line C. Begins at the intersection of 70° N., 144° W., thence by great circle arc to the intersection of 60° N., 143° W., thence by great circle arc so as to include all of the Alaskan Panhandle. (FCC)

Line D. Begins at the intersection of 70° N., 138° W., thence by great circle arc to the intersection of 61°20′ N., 139° W. (Burwash Landing), thence by great circle arc to the intersection of 60°45′ N., 135° W., thence by great circle arc to the intersection of 56° N., 128° W., thence south along 128° meridian to Lat. 55° N., thence by great circle arc to the intersection of 54° N., 130° W., thence by great circle arc to Port Clements, thence to the Pacific Ocean where it ends. (FCC)

Maritime Mobile-Satellite Service. A mobile-satellite service in which mobile earth stations are located on board ships; survival craft stations and emergency position-indicating radiobeacon stations may also participate in this service. (RR)

Maritime Mobile Service. A mobile service between coast stations and ship stations, or between ship stations, or between associated on-board communication stations; survival craft stations and emergency position-indicating radiobeacon stations may also participate in this service. (RR)

Maritime Radionavigation-Satellite Service. A radionavigation-satellite service in which earth stations are located on board ships. (RR)

Maritime Radionavigation Service. A radionavigation service intended for the benefit and for the safe operation of ships. (RR)

Marker Beacon. A transmitter in the aeronautical radionavigation service which radiates vertically a distinctive pattern for providing position information to aircraft. (RR)

Mean Power (of a radio transmitter). The average power supplied to the antenna transmission line by a transmitter during an interval of time sufficiently long compared with the lowest frequency encountered in the modulation taken under normal operating conditions. (RR)

Meteorological Aids Service. A radiocommunication service used for meteorological, including hydrological, observation and exploration. (RR)

Meteorological-Satellite Service. An earth exploration-satellite service for meteorological purposes. (RR)

Mobile Earth Station. An earth station in the mobile-satellite service intended to be used while in motion or during halts at unspecified points. (RR)

Mobile-Satellite Service. A radiocommunication service:

(1) Between mobile earth stations and one or more space stations, or between space stations used by this service; or

(2) Between mobile earth stations by means of one or more space stations.

NOTE: This service may also include feeder links necessary for its operation. (RR)

Mobile Service. A radiocommunication service between mobile and land stations, or between mobile stations. (CONV)

Mobile Station. A station in the mobile service intended to be used while in motion or during halts at unspecified points. (RR)

Multi-Satellite Link. A radio link between a transmitting earth station and a receiving earth station through two or more satellites, without any intermediate earth station.

NOTE: A multisatellite link comprises one up-link, one or more satellite-to-satellite links and one down-link. (RR)

Necessary Bandwidth. For a given class of emission, the width of the frequency band which is just sufficient to ensure the transmission of information at the rate and with the quality required under specified conditions. (RR)

Non-Voice, Non-Geostationary Mobile-Satellite Service. A mobile-satellite service reserved for use by non-geostationary satellites in the provision of non-voice communications which may include satellite links between land earth stations at fixed locations.

Occupied Bandwidth. The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage Beta/2 of the total mean power of a given emission.

NOTE: Unless otherwise specified by the CCIR for the appropriate class of emission, the value of Beta/2 should be taken as 0.5%. (RR)

On-Board Communication Station. A low-powered mobile station in the maritime mobile service intended for use for internal communications on board a ship, or between a ship and its lifeboats and life-rafts during lifeboat drills or operations, or for communication within a group of vessels being towed or pushed, as well as for line handling and mooring instructions. (RR)

Orbit. The path, relative to a specified frame of reference, described by the centre of mass of a satellite or other object in space subjected primarily to natural forces, mainly the force of gravity. (RR)

Out-of-band Emission. Emission on a frequency or frequencies immediately outside the necessary bandwidth which results from the modulation process, but excluding spurious emissions. (RR)

Passive Sensor. A measuring instrument in the earth exploration-satellite service or in the space research service by means of which information is obtained by reception of radio waves of natural origin. (RR)

Peak Envelope Power (of a radio transmitter). The average power supplied to the antenna transmission line by a transmitter during one radio frequency cycle at the crest of the modulation envelope taken under normal operating conditions. (RR)

Period (of a satellite). The time elapsing between two consecutive passages of a satellite through a characteristic point on its orbit. (RR)

Permissible Interference. Observed or predicted interference which complies with quantitative interference and sharing criteria contained in these [international Radio] Regulations or in CCIR Recommendations or in special agreements as provided for in these Regulations. (RR)

Port Operations Service. A maritime mobile service in or near a port, between coast stations and ship stations, or between ship stations, in which messages are restricted to those relating to the operational handling, the movement and the safty of ships and, in emergency, to the safety of persons.

NOTE: Messages which are of a public correspondence nature shall be excluded from this service. (RR)

Port Station. A coast station in the port operations service. (RR)

Power. Whenever the power of a radio transmitter, etc. is referred to it shall be expressed in one of the following forms, according to the class of emission, using the arbitrary symbols indicated:

(1) Peak envelope power (PX or pX);
(2) Mean power (PY or pY);
(3) Carrier power (PZ or pZ).

NOTE 1: For different classes of emission, the relationships between peak envelope power, mean power and carrier power, under the conditions of normal operation and of no modulation, are contained in CCIR Recommendations which may be used as a guide.

NOTE 2: For use in formulae, the symbol ''p'' denotes power expressed in watts and the symbol ''P'' denotes power expressed in decibels relative to a reference level. (RR)

Primary Radar. A radiodetermination system based on the comparison of reference signals with radio signals reflected from the position to be determined. (RR)

Protection Ratio. The minimum value of the wanted-to-unwanted signal ratio, usually expressed in decibels, at the receiver input determined under specified conditions such that a specified reception quality of the wanted

signal is achieved at the receiver output. (RR)

Pseudorandom sequence. A sequence of binary data which has some of the characteristics of a random sequence but also has some characteristics which are not random. It resembles a true random sequence in that the one bits and zero bits of the sequence are distributed randomly throughout every length, N, of the sequence and the total numbers of the one and zero bits in that length are approximately equal. It is not a true random sequence, however, because it consists of a fixed number (or length) of coded bits which repeats itself exactly whenever that length is exceeded, and because it is generated by a fixed algorithm from some fixed initial state.

Public Correspondence. Any telecommunication which the offices and stations must, by reason of their being at the disposal of the public, accept for transmission. (CONV)

Pulsed FM Systems. A pulsed FM system is a spread spectrum system in which a RF carrier is modulated with a fixed period and fixed duty cycle sequence. At the beginning of each transmitted pulse, the carrier frequency is frequency modulated causing an additional spreading of the carrier. The pattern of the frequency modulation will depend upon the spreading function which is chosen. In some systems the spreading function is a linear FM chirp sweep, sweeping either up or down in frequency.

Radar. A radiodetermination system based on the comparison of reference signals with radio signals reflected, or retrainsmitted, from the position to be determined. (RR)

Radar Beacon (RACON). A transmitter-receiver associated with a fixed navigational mark which, when triggered by a radar, automatically returns a distinctive signal which can appear on the display of the triggering radar, providing range, bearing and identification information. (RR)

Radiation. The outward flow of energy from any source in the form of radio waves. (RR)

Radio. A general term applied to the use of radio waves. (CONV)

Radio Altimeter. Radionavigation equipment, on board an aircraft or spacecraft or the spacecraft above the Earth's surface or another surface. (RR)

Radio Astronomy. Astronomy based on the reception of radio waves of cosmic origin. (RR)

Radio Astronomy Service. A service involving the use of radio astronomy. (RR)

Radio Astronomy Station. A station in the radio astronomy service. (RR)

Radiobeacon Station. A station in the radionavigation service the emissions of which are intended to enable a mobile station to determine its bearing or direction in relation to radiobeacon station. (RR)

Radiocommunication. Telecommunication by means of radio waves. (CONV)

Radiocommunication Service. A service as defined in this Section involving the transmission, emission and/or reception of radio waves for specific telecommunication purposes.

NOTE: In these [international] Radio Regulations, unless otherwise stated, any radiocommunication service relates to terrestrial radiocommunication. (RR)

Radiodetermination. The determination of the position, velocity and/or other characteristics of an object, or the obtaining of information relating to these parameters, by means of the propagation properties of radio waves. (RR)

Radiodetermination-Satellite Service. A radiocommunication service for the purpose of radiodetermination involving the use or one of more space stations. This service may also include feeder links necessary for its own operation. (RR)

Radiodetermination Service. A radiocommunication service for the purpose of radiodetermination. (RR)

Radiodetermination Station. A station in the radiodetermination serviice. (RR)

Radio Direction-Finding. Radiodetermination using the reception of radio waves for the purpose of determining the direction of a station or object. (RR)

Radio Direction-Finding Station. A radiodetermination station using radio direction-finding. (RR)

Radiolocation. Radiodetermination used for purposes other than those of radionavigation. (RR)

Radiolocation Land Station. A station in the radiolocation service not intended to be used while in motion. (RR)

Radiolocation Mobil Station. A station in the radiolocation service intended to be used while in motion or during halts at unspecified points. (RR)

Radiolocation Service. A radiodetermination service for the purpose of radiolocation. (RR)

Radionavigation. Radiodetermination used for the purposes of navigation, including obstruction warning.

Radionavigation Land Station. A station in the radionavigation service not intended to be used while in motion. (RR)

Radionavigation Mobile Station. A station in the radionavigation service intended to be used while in motion or during halts at unspecified points. (RR)

Radionavigation-Satellite Service. A radiodetermination-satellite service used for the purpose of radionavigation. This service may also include feeder links necessary for its operation. (RR)

Radionavigation Service. A radiodetermination service for the purpose of radionavigation. (RR)

Radiosonde. An automatic radio transmitter in the meteorological aids service usually carried on an aircraft, free ballon, kite or parachute, and which transmits meteorological data. (RR)

Radiotelegram. A telegram, originating in or intended for a mobile station or a mobile earth station transmitted on all or part of its route over the radiocommunication channels of the mobile service or of the mobile-satellite service. (RR)

Radiotelemetry. Telemetry by means of radio waves. (RR)

Radiotelephone Call. A telephone call, originating in or intended for a mobile station or a mobile earth station, transmitted on all or part of its route over the radiocommunication channels of the mobile service or of the mobile-satellite service. (RR)

Radiotelex Call. A telex call, originating in or intended for a mobile station or a mobile earth station, transmitted on all or part of its route over the radiocommunication channels of the mobile service or the mobile-satellite service. (RR)

Radio Waves or Hertzian Waves. Electromagnetic waves of frequencies arbitrarily lower than 3,000 GHz, propagated in space without aritificial guide. (RR)

Reduced Carrier Single-Sideband Emission. A single-sideband emission in which the degree of carrier suppession enables the carrier to be reconstrituted and to be used for demodulation. (RR)

Reference Frequency. A frequency having a fixed and specified position with respect to the assigned frequency. The displacement of this frequency with respect to the assigned frequency has the same absolute value and sign that the displacement of the characteristic frequency has with respect to the centre of the frequency band occupied by the emission. (RR)

Reflecting Satellite. A satellite intended to reflect radiocommunication signals. (RR)

Right-Hand (or Clockwise) Polarized Wave. An Elliptically or circularly-polarized wave, in which the electric field vector, observed in any fixed plane, normal to the direction of propagation, whilst looking in the direction of propagation, rotates with time in a right-hand or clockwise direction. (RR)

Safety Service. Any radiocommunication service used permanently or temporarily for the safeguarding of human life and property. (CONV)

Satellite. A body which revolves around another body of preponderant mass and which has a motion primarily and permanently determined by the force of attraction of that other body. (RR)

Satellite Link. A radio link between a transmitting earth station and a receiving earth station through one satellite. A satellite link comprises one up-link and one down-link. (RR)

Satellite Network. A satellite system or a part of a satellite system, consisting of only one satellite and the cooperating earth stations. (RR)

Satellite System. A space system using one or more artificial earth satellites. (RR)

Secondary Radar. A radiodetermination system based on the comparison

of reference signals with radio signals retransmitted from the position to be determined. (RR)

Semi-Duplex Operation. A method which is simplex operation at one end of the circuit and duplex operation at the other.[3] (RR)

Ship Earth Station. A mobile earth station in the maritime mobile-satellite service located on board ship. (RR)

Ship Movement Service. A safety service in the maritime mobile service other than a port operations service, between coast stations and ship stations, or between ship stations, in which messages are restricted to those relating to the movement of ships. Messages which are of a public correspondence nature shall be excluded from this service. (RR)

Ship's Emergency Transmitter. A ship's transmitter to be used exclusively on a distress frequency for distress, urgency or safety purposes. (RR)

Ship Station. A mobile station in the maritime mobile service located on board a vessel which is not permanently moored, other than a survival craft station. (RR)

Simplex Operation. Operating method in which transmission is made possible alternatively in each direction of a telecommunication channel, for example, by means of manual control.[5] (RR)

Single-Sideband Emission. An amplitude modulated emission with one sideband only. (RR)

Spacecraft. A man-made vehicle which is intended to go beyond the major portion of the Earth's atmosphere. (RR)

Space Operation Service. A radiocommunication service concerned exclusively with the operation of spacecraft, in particular space tracking, space telemetry, and space telecommand.

NOTE: These functions will normally be provided within the service in which the space station is operating. (RR)

Space Radiocommunication. Any radiocommunication involving the use of one or more space stations or the use of one or more reflecting satellites or other objects in space. (RR)

Space Research Service. A radiocommunication service in which spacecraft or other objects in space are used for scientific or technological research purposes. (RR)

Space Station. A station located on an object which is beyond, is intended to go beyond, or has been beyond, the major portion of the Earth's atmosphere. (RR)

Space System. Any group of cooperating Earth stations and/or space stations employing space radiocommunication for specific purposes. (RR)

Space Telecommand. The use of radiocommunication for the transmission of signals to a space station to initiate, modify or terminate functions of equipment on a space object, incuding the space station. (RR)

Space Telemetry. The use of telemetry for transmission for a space station of results of measurements made in a spacecraft, including those relating to the functioning of the spacecraft. (RR)

Space Tracking. Determination of the orbit, velocity or instanteneous position of an object in space by means of radiodetermination, excluding primary radar, for the purpose of following the movement of the object. (RR)

Special Service. A radiocommunication service, not otherwise defined in this Section, carried on exclusively for specific needs of general utility, and not open to public correspondence. (RR)

Spread Spectrum Systems. A spread spectrum system is an information bearing communications system in which: (1) Information is conveyed by modulation of a carrier by some conventional means, (2) the bandwidth is deliberately widened by means of a spreading function over that which would be needed to transmit the information alone. (In some spread spectrum systems, a portion of the information being conveyed by the system may be contained in the spreading function.)

Spurious Emission. Emission on a frequency or frequencies which are outside the necessary bandwidth and the level of which may be reduced without affecting the corresponding transmission of information. Spurious emissions include harmonic emissions,

[5] (See footnote under Duplex Operations.)

parasitic emissions, intermodulation products and frequency conversion products, but exclude out-of-band emissions. (RR)

Standard Frequency and Time Signal-Satellite Service. A radiocommunication service using space stations on earth satellites for the same purposes as those of the standard frequency and time signal service.

NOTE: This service may also include feeder links necessary for its operation. (RR)

Standard Frequency and Time Signal Service. A radiocommunication service for scientific, technical and other purposes, providing the transmission of specified frequencies, time signals, or both, of stated high precision, intended for general reception. (RR)

Standard Frequency and Time Signal Station. A station in the standard frequency and time signal service. (RR)

Station. One or more transmitters or receivers or a combination of transmitters and receivers, including the accessory equipment, necessary at one location for carrying on a radiocommunication service, or the radio astronomy service.

NOTE: Each station shall be classified by the service in which it operates permanently or temporarily. (RR)

Suppressed Carrier Single-Sideband Emission. A single-sideband emission in which the carrier is virtually suppressed and not intended to be used for demodulation. (RR)

Survival Craft Station. A mobile station in the maritime mobile service or the aeronautical mobile service intended solely for survival purposes and located on any lifeboat, life-raft or other survival equipment. (RR)

Telecommand. The use of telecommunication for the transmission of signals to initiate, modify or terminate functions of equipment at a distance. (RR)

Telecommunication. Any transmission, emission or reception of signs, signals, writing, images and sounds or intelligence of any nature by wire, radio, optical or other electromagnetic systems. (CONV)

Telegram. Written matter intended to be transmitted by telegraphy for delivery to the addressee. This term also includes radiotelegrams unless otherwise specified.

NOTE: In this definition the term *telegraphy* has the same general meaning as defined in the Convention. (CONV)

Telegraphy. A form of telecommunication which is concerned in any process providing transmission and reproduction at a distance of documentary matter, such as written or printed matter or fixed images, or the reproduction at a distance of any kind of information in such a form. For the purposes of the [international] Radio Regulations, unless otherwise specified therein, telegraphy shall mean a form of telecommunication for the transmission of written matter by the use of a signal code.[6] (RR)

Telemetry. The use of telecommunication for automatical indicating or recording measurements at a distance from the measuring instrument. (RR)

Telephony. A form of telecommunication set up for the transmission of speech or, in some cases, other sounds.[7] (RR)

Television. A form of telecommunication for the transmission of transient images of fixed or moving objects. (RR)

Terrestrial Radiocommunication. Any radiocommunication other than space radiocommunication or radio astronomy. (RR)

Terrestrial Station. A station effecting terrestrial radiocommunication.

NOTE: In these [international Radio] Regulations, unless otherwise stated, any station is a terrestrial station. (RR)

Time Hopping Systems. A time hopping system is a spread spectrum system in which the period and duty cycle of a pulsed RF carrier are varied in a pseudorandom manner under the control of a coded sequence. Time hopping is often used effectively with frequency hopping to form a hybrid time-division, multiple-access (TDMA) spread spectrum system.

Transponder. A transmitter-receiver facility the function of which is to transmit signals automatically when the proper interrogation is received. (FCC)

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[6] (See footnote under Harmful Interference)

[7] (See footnote under Harmful Interference)

Tropospheric Scatter. The propagation of radio waves by scattering as a result of irregularities or discontinuities in the physical properties of the troposphere. (RR)

Unwanted Emissions. Consist of spurious emissions and out-of-band emissions. (RR)

[49 FR 2368, Jan. 19, 1984, as amended at 50 FR 25239, June 18, 1985; 51 FR 37399, Oct. 22, 1986; 52 FR 7417, Mar. 11, 1987; 54 FR 49980, Dec. 4, 1990; 55 FR 28761, July 13, 1990; 56 FR 42703, Aug. 29, 1991; 58 FR 68058, Dec. 23, 1993]

Subpart B—Allocation, Assignment, and Use of Radio Frequencies

SOURCE: 49 FR 2373, Jan. 19, 1984, unless otherwise noted.

§2.100 International regulations in force.

The international *Radio Regulations* (Geneva, 1982), became effective internationally on 1 January 1982, and nationally on September 6, 1983. They are incorporated to the extent practicable in this part.

§2.101 Nomenclature of frequencies.

Band No.	Frequency subdivision	Frequency range
4	VLF (very low frequency).	Below 30 kHz.
5	LF (low frequency)	30 to 300 kHz.
6	MF (medium frequency).	300 to 3000 kHz.
7	HF (high frequency)	3 to 30 MHz.
8	VHF (very high frequency).	30 to 300 MHz.
9	UHF (ultra high frequency).	300 to 3000 MHz.
10	SHF (super high frequency).	3 to 30 GHz.
11	EHF (extremely high frequency).	30 to 300 GHz
12		300 to 3000 GHz.

§2.102 Assignment of frequencies.

(a) Except as otherwise provided in this section, the assignment of frequencies and bands of frequencies to all stations and classes of stations and the licensing and authorizing of the use of all such frequencies between 9 kHz and 400 GHz, and the actual use of such frequencies for radiocommunication or for any other purpose, including the transfer of energy by radio, shall be in accordance with the Table of Frequency Allocations in §2.106.

(b) On the condition that harmful interference will not be caused to services operating in accordance with the Table of Frequency Allocations the following exceptions to paragraph (a) of this section may be authorized:

(1) In individual cases the Commission may, without rule making proceedings, authorize on a temporary basis only, the use of frequencies not in accordance with the Table of Frequency Allocations for projects of short duration or emergencies where the Commission finds that important or exceptional circumstances require such utilization. Such authorizations are not intended to develop a service to be operated on frequencies other than those allocated such service.

(2) A station for the development of techniques or equipment to be employed by services set forth in column 5 of the Table of Frequency Allocations may be authorized the use of frequencies allocated to those services or classes of stations.

(3) Experimental stations pursuant to part 5, may be authorized the use of any frequency or frequency band not exclusively allocated to the passive services (including the Radio Astronomy Service).

(4) In the event a band is reallocated so as to delete its availability for use by a particular service, the Commission may provide for the further interim use of the band by stations in that service for a temporary, specific period of time.

(c) Non-Government stations may be authorized to use Government frequencies in the bands above 25 MHz if the Commission finds, after consultations with the appropriate Government agency or agencies, that such use is necessary for coordination of Government and non-Government activities: Provided, however, that:

(1) Non-Government operation on Government frequencies shall conform with the conditions agreed upon by the Commission and the National Telecommunications and Information Administration (NTIA) (the more important of which are contained in paragraphs (c) (2), (3), and (4) of this section);

(2) Such operations shall be in accordance with NTIA rules governing

the service to which the frequencies involved are allocated;

(3) Such operations shall not cause harmful interference to Government stations and, should harmful interference result, that the interfering non-Government operation shall immediately terminate; and

(4) Non-Government operation has been certified as necessary by the Government agency involved and this certification has been furnished, in writing, to the non-Government licensee with which communication is required.

(d) Aircraft stations may communicate with stations of the maritime mobile service. They shall then conform to those provisions of the international *Radio Regulations* which relate to the maritime mobile service. For this purpose aircraft stations should use the frequencies allocated to the maritime mobile service. However, having regard to interference which may be caused by aircraft stations at high altitudes, maritime mobile frequencies in the bands above 30 MHz shall not be used by aircraft stations in any specific area without the prior agreement of all administrations of the area in which interference is likely to be caused. In particular, aircraft stations operating in Region 1 should not use frequencies in the bands above 30 MHz allocated to the maritime mobile service by virtue of any agreement between administrations in that Region.

(e) Non-Government services operating on frequencies in the band 25–50 MHz must recognize that it is shared with various services of other countries; that harmful interference may be caused by skywave signals received from distant stations of all services of the United States and other countries radiating power on frequencies in this band; and that no protection from such harmful interference generally can be expected. Persons desiring to avoid such harmful interference should consider operation on available frequencies higher in the radio spectrum not generally subject to this type of difficulty.

(f) The stations of a service shall use frequencies so separated from the limits of a band allocated to that service as not to cause harmful interference to allocated services in immediately adjoining frequency bands.

(g) In the bands above 25 MHz which are allocated to the non-Government land mobile service, fixed stations may be authorized on the following conditions:

(1) That such stations are authorized in the service shown in Column 5 of the Table of Frequency Allocations in the band in question;

(2) That harmful interference will not be caused to services operating in accordance with the Table of Frequency Allocations.

(h) Special provisions regarding the use of spectrum allocated to the fixed and land mobile services below 25 MHz by non-Government stations.

(1) Only in the following circumstances will authority be extended to stations in the fixed service to operate on frequencies below 25 MHz.

(i) With respect to aeronautical fixed stations, only when a showing can be made that more suitable facilities are not available.

(ii) With respect to fixed stations, except aeronautical fixed stations, only to:

(A) Provide communication circuits in emergency and/or disaster situations, where safety of life and property are concerned;

(B) Provide standby and/or backup facilities to satellite and cable circuits used for international public correspondence;

(C) Provide standby and/or backup communications circuits to regular domestic communication circuits which have been disrupted by disasters and/or emergencies;

(D) Provide communication circuits wholly within the State of Alaska and the United States insular areas in the Pacific; and

(E) Provide communication circuits to support operations which are highly important to the national interest and where other means of telecommunication are unavailable.

(2) Only in the following circumstances will authority be extended to stations in the land mobile service to operate below 25 MHz.

(i) Provide communication circuits in emergency and/or disaster situations, where safety of life and property are concerned;

(ii) Provide standby and/or backup communications circuits to regular domestic communication circuits which have been disrupted by disasters and/or emergencies;

(iii) Provide communication circuits wholly within the State of Alaska and the United States insular areas in the Pacific; and

(iv) Provide communication circuits to support operations which are highly important to the national interest and where other means of telecommunication are unavailable.

(3) Except in the State of Alaska and the United States Pacific insular areas, the Commission does not intend to seek international protection for assignments made pursuant to paragraphs (h) (1)(ii) and (2) of this section; this results in the following constraints upon the circuits/assignments.

(i) The Commission will not accept responsibility for protection of the circuits from harmful interference caused by foreign operations.

(ii) In the event that a complaint of harmful interference resulting from operation of these circuits is received from a foreign source, the offending circuit(s) must cease operation on the particular frequency concerned.

(iii) In order to accommodate the situations described in paragraphs (h)(3) (i) and (ii) of this section, equipments shall be capable of transmitting and receiving on any frequency in the bands assigned to the particular operation and capable of immediate change among the frequencies.

§2.103 Government use of non-Government frequencies.

Government stations may be authorized to use non-Government frequencies in the bands above 25 MHz if the Commission finds that such use is necessary for coordination of Government and non-Government actitivies: Provided, however, That:

(a) Government operation on non-Government frequencies shall conform with the conditions agreed upon by the Commission and the National Telecommunications and Information Administration (the more important of which are contained in paragraphs (b), (c), and (d) of this section);

(b) Such operations shall be in accordance with Commission rules governing the service to which the frequencies involved are allocated;

(c) Such operations shall not cause harmful interference to non-Government stations and, should harmful interference result, that the interfering Government operation shall immediately terminate; and

(d) Government operation has been certified as necessary by the non-Government licensees involved and this certification has been furnished, in writing, to the Government agency with which communication is required.

§2.104 International Table of Frequency Allocations.

(a) The International Table of Frequency Allocations (columns 1, 2 and 3 of §2.106) is included for informational purposes only.

(b) *Regions.* To facilitate the international allocating of the radio spectrum, the International Telecommunication Union (ITU) has divided the world into three Regions[1] as shown in Figure 1 and described below:

(1) Region 1 includes the area limited on the East by line A (lines A, B and C are defined below) and on the West by line B, excluding any of the territory of Iran which lies between these limits. It also includes that part of the territory of Turkey and the Union of Soviet Socialist Republics (U.S.S.R.) lying outside of these limits, the territory of the Mongolian Peoples' Republic, and the area to the North of the U.S.S.R. which lies between lines A and C.

(2) Region 2 includes the area limited on the East by line B and the West by line C.

(3) Region 3 includes the area limited on the East by line C and on the West by line A, except the territories of the Mongolian Peoples' Republic, Turkey, the territory of the U.S.S.R. and the area to the North of the U.S.S.R. It

[1] It should be noted that where the words ''region'' or ''regional'' are without a capital ''R'', they do not relate to the three Regions here defined for purpose of frequency allocation.

also includes that part of the territory of Iran lying outside of those limits.

(4) The lines A, B and C are defined as follows:

(i) Line A extends from the North Pole along meridian 40° West of Greenwich to parallel 40° North; thence by great circle arc to the intersection of meridian 60° East and the Tropic of Cancer; thence along the meridian 60° East to the South Pole.

(ii) Line B extends from the North Pole along meridian 10° West of Greenwich to its intersection with parallel 72° North; thence by great circle arc to the intersection of meridian 50° West and parallel 40° North; thence by great circle arc to the intersection of meridian 20° West and to the South Pole.

(iii) Line C extends from the North Pole by great circle arc to the intersection of parallel 65°30′ North of the international boundary in Bering Strait; thence by great circle arc to the intersection of meridian 165° East of Greenwich and parallel 50° North; thence by great circle arc to the intersection of meridian 170° West and parallel 10° North; thence along parallel 10° North to its intersection with meridian 120° West; thence along meridian 120° West to the South Pole.

(c) *Areas.* To further assist in the international allocation of the radio spectrum, the ITU has established several special geographical areas and they are defined below.

(1) The ''African Broadcasting Area'' consists of:

(i) African countries, parts of countries, territories and groups of territories situated between the parallels 40° South and 30° North;

(ii) Islands in the Indian Ocean west of meridian 60° East of Greenwich, situated between the parallel 40° South and the great circle arc joining the points 45° East, 11°30′ North and 60° East, 15° North; and

(iii) Islands in the Atlantic Ocean east of Line B, situated between the parallel 40° South and 30° North.

(2) The ''European Broadcasting Area'' is bounded on the West by the western boundary of Region 1, on the East by the meridian 40° East of Greenwich and on the South by the parallel 30° North so as to include the western part of the U.S.S.R., the northern part of Saudi Arabia and that part of those countries bordering the Mediterranean within these limits. In addition, Iraq and Jordan are included in the European Broadcasting Area.

(3) The ''European Maritime Area'' is bounded to the north by a line extending along parallel 72° North from its intersection with meridian 55° East of Greenwich to its intersection with meridian 5° West, then along meridian 5° West to its intersection with parallel 67° North, thence along parallel 6° North to its intersection with meridian 32° West; to the west by a line extending along meridian 32° West to its intersection with parallel 30° North; to the south by a line extending along parallel 30° North to its intersection with meridian 43° East; to the east by a line extending along meridian 43° East to its intersection with parallel 60° North, thence along parallel 60° North to its intersection with meridian 55° East and thence along meridian 55° East to its intersection with parallel 72° North.

(4) The ''Tropical Zone'' (see Figure 1) is defined as:

(i) The whole of that area in Region 2 between the Tropics of Cancer and Capricorn;

(ii) The whole of that area in Region 1 and 3 contained between the parallel 30° North and 35° South with the addition of:

(iii) The area contained between the meridian 40° East and 80° East of Greenwich and the parallels 30° North and 40° and

(iv) That part of Libya North of parallel 30° North.

(v) In Region 2, the Tropical Zone may be extended to parallel 33° North, subject to special agreements between the countries concerned in that Region.

(5) A sub-Region is an area consisting of two or more countries in the same Region.

(d) *Categories of service.* (1) Any segment of the radio spectrum can be allocated to one or more radio services[2] either on a worldwide or Regional basis. In the case where an allocation has

[2] Definitions of the various radio services used in columns 1 through 3 of § 2.106 are contained in § 2.1.

been made to more than one service, such services are listed in the following order:

(i) Services the names of which are printed in ''capitals'' [example: FIXED]; these are called ''primary'' services;

(ii) Services, the names of which are printed in ''capitals'' between oblique strokes [example: /RADIOLOCATION/]; these are called ''permitted'' services;

(iii) Services, the names of which are printed in ''normal characters'' [example: Mobile]; these are called ''secondary'' services.

(2) Additional remarks pertaining to an allocation are printed in ''normal characters'' [example: MOBILE except aeronautical mobile].

(3) Permitted and primary services have equal rights, except that, in the preparation of frequency plans, the primary services, as compared with the permitted services, shall have prior choice of frequencies.

(4) *Stations of a secondary service:*

(i) Shall not cause harmful interference to stations of primary or permitted services to which frequencies are already assigned or to which frequencies may be assigned at a later date;

(ii) Cannot claim protection from harmful interference from stations of a primary or permitted service to which frequencies are already assigned or may be assigned at a later date;

(iii) Can claim protection, however, from harmful interference from stations of the same or other secondary service(s) to which frequencies may be assigned at a later date.

(5) Where a band is indicated in a footnote of the International Table (i.e., columns 1, 2, and 3 of § 2.106) as allocated to a service ''on a secondary basis'' in an area smaller than a Region, or in a particular country, this is a secondary service.

(6) Where a band is indicated in a footnote of the International Table as allocated to a service ''on a primary basis'', or ''on a permitted basis'' in an area smaller than a Region, or in a particular country, this is a primary service or a permitted service only in that area country.

(e) *Additional allocations.* (1) Where a band is indicated in a footnote of the International Table as ''also allocated'' to a service in an area smaller than a Region, or in a particular country, this is an ''additional'' allocation, i.e., an allocation which is added in this country area or in this country to the service or services which are indicated in the International Table.

(2) If the footnote does not include any restriction on the service or services concerned apart from the restriction to operate only in a particular area or country, stations of this service or these services shall have equality of right to operate with stations of the other primary service or services indicated in the International Table.

(3) If restrictions are imposed on an additional allocation in addition to the restriction to operate only in a particular area or country, this is indicated in the footnote of the International Table.

(f) *Alternative allocations.* (1) Where a band is indicated in a footnote of the International Table as ''allocated'' to one or more services in an area smaller than a Region, or in a particular country, this is an ''alternative'' allocation, i.e., an allocation which replaces, in this area or in this country, the allocations indicated in the International Table.

(2) If the footnote does not include any restriction on stations of the service or services concerned, apart from the restriction to operate only in a particular area or country, these stations of such a service or services shall have an equality of right to operate with stations of the primary service or services, shall have an equality of right to operate with stations of the primary service or services, indicated in the International Table, to which the band is allocated in other areas or countries.

(3) If restrictions are imposed on stations of a service to which an alternative allocation is made, in addition to the restriction to operate only in a particular country or area, this is indicated in the footnote.

(g) *Miscellaneous provision.* (1) Where it is indicated that a service may operate in a specific frequency band subject to not causing harmful interference, this means also that this service cannot claim protection from harmful interference caused by other services to

which the band is allocated under Chapter III of the international *Radio Regulations.*

(2) Except if otherwise specified in a footnote, the term *fixed service* does not include systems using ionospheric scatter propagation.

(h) *Format of the International Table.* (1) The heading of the International Table includes three columns (columns number 1, 2 and 3 of § 2.106), each of which corresponds to one of the Regions. Where an allocation occupies the whole of the width of the Table or only two of the three columns, this is a world-wide allocation or a Regional allocation, respectively.

(2) The frequency band referred to in each allocation is indicated in the left-hand top corner of the part of the Table concerned.

(3) Within each of the categories specified in paragraph (c)(1) of this section, services are listed in alphabetical order according to the French language.[3] The order of listing does not indicate relative priority within each category.

(4) In the case where there is a parenthetical addition to an allocation in the International Table [example: FIXED-SATELLITE (space-to-earth)], that service allocation is restricted to the type of operation so indicated.

(5) The footnote references which appear in the International Table below the allocated service or services apply to the whole of the allocation concerned.

(6) The footnote references which appear to the right of the name of a service are applicable only to that particular service.

(7) In certain cases, the names of countries appearing in the footnotes have been simplified in order to shorten the text.

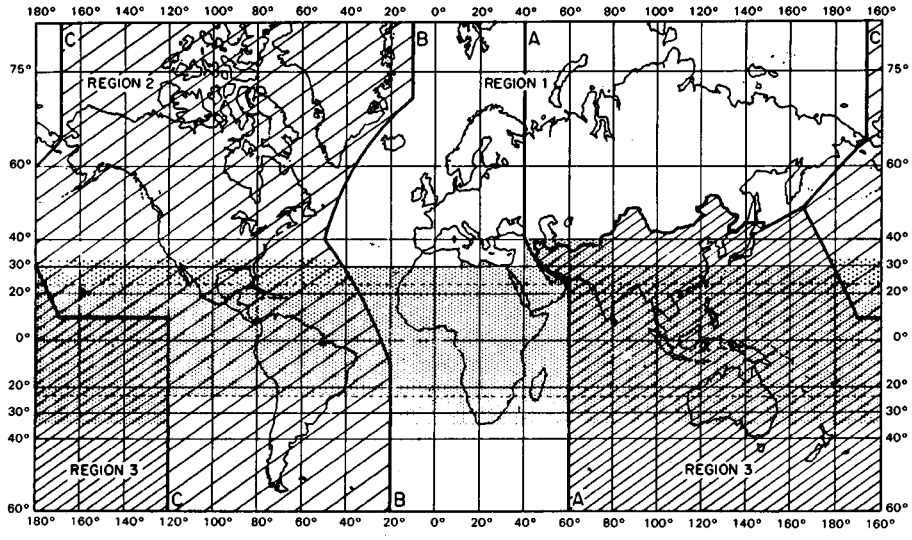


Figure 1. Chart of the International Regions and Zones as defined in the International Table of Frequency Allocations. [Note: The shaded part represents the Tropical Zone as defined by § 2.104(b)(4).]

[3] French is used to keep this table consistent with the International Table as published by ITU.

[49 FR 2373, Jan. 19, 1984, as amended at 54 FR 49981, Dec. 4, 1989; 61 FR 15384, Apr. 8, 1996]

§ 2.105 United States Table of Frequency Allocations.

(a) The United States Table of Frequency Allocations (columns 4 through 7 of § 2.106) is based on the International plan for Region 2 because the relevant area of jurisdiction is located primarily in Region 2[1] (i.e., the 50 States, the District of Columbia, the Caribbean insular areas[2] and some of the Pacific insular areas[3]).[4] Because there is a need to provide radio spectrum for both Federal government and non-Federal government operations, the United States Table is divided into the Government Table of Frequency Allocation and the Non-Government Table of Frequency Allocations. The Government plan, as shown in column 4 of § 2.106, is administered by the National Telecommunications and Information Administration (NTIA)[5], whereas the non-Government plan, as shown in column 5 of § 2.106, is administered by the Federal Communications Commission (FCC)[6]

(b) In the United States, radio spectrum may be allocated to either Government or non-Government use exclusively, or for shared use. In the case of shared use, the type of service(s) permitted need not be the same [e.g., Government FIXED, non-Government MOBILE]. The terms used to designate categories of service[7] in columns 4 and 5 of § 2.106, correspond to the terms employed by the International Telecommunication Union (ITU) in the international *Radio Regulations.*

(c) *Categories of services.* (1) Any segment of the radio spectrum may be allocated to the Government and/or non-Government sectors either on an exclusive or shared basis for use by one or more radio services. In the case where an allocation has been made to more than one service, such services are listed in the following order:

(i) Services, the names of which are printed in ''capitals'' [example: FIXED]; these are called ''primary'' services;

(ii) Services, the names of which are printed in capitals between oblique strokes [example: /RADIOLOCATION/]; these are called ''permitted services'';

(iii) Services, the names of which are printed in ''normal characters'' [example: Mobile]; these are called ''secondary'' services.

(2) Permitted and primary services have equal rights, except that, in the preparation of frequency plans, the primary services, as compared with the permitted services, shall have prior choice of frequencies.

(3) Stations of a secondary service:

(i) Shall not cause harmful interference to stations of primary or permitted services to which frequencies are already assigned or to which frequencies may be assigned at a later date.

(ii) Cannot claim protection from harmful interference from stations of a primary or permitted service to which frequencies are already assigned or may be assigned at a later date; and

(iii) Can claim protection, however, from harmful interference from stations of the same or other secondary service(s) to which frequencies may be assigned at a later date.

[1] See § 2.104(a)(1) for definition of Region 2.

[2] The Caribbean insular areas are: The Commonwealth of Puerto Rico; the unincorporated territory of the United States Virgin Islands; and Navassa Island, Quita Sueno Bank, Roncador Bank, serrana Bank and Serranilla Bank.

[3] The Pacific insular areas located in Region 2 are: Johnston Island and Midway Island.

[4] The operation of stations in the Pacific insular areas located in Region 3 are generally governed by the International plan for Region 3 (i.e., column 3 of § 2.106). The Pacific insular areas located in Region 3 are: the Commonwealth of the Northern Mariana Islands; the unincorporated territory of American Samoa; the unincorporated territory of Guam; and Baker Island, Howland Island, Jarvis Island, Kingman Reef, Palmyra Island and Wake Island.

[5] Section 305(a) of the Communications Act of 1934, as amended; Executive Order 12046 (26 March 1978) and Department of Commerce Organization Order 10–10 (9 May 1979).

[6] The Communications Act of 1934, as amended.

[7] Definitions of the various radio services used are contained in § 2.1.

(d) *Format of the United States Table.* (1) The frequency band referred to in each allocation, column 4 for Government and column 5 for non-Government, is indicated in the left-hand top corner of the column. If there is no service or footnote indicated for a band of frequencies in either column 4 or 5, then the Government or the non-Government sector, respectively, has no access to that band except as provided for by §2.102.

(2) The Government allocation plan, given in column 4, is included for informational purposes only.

(3) In the case where there is a parenthetical addition to an allocation in the United States Table [example: FIXED-SATELLITE (space-to-earth)], that service allocation is restricted to the type of operation so indicated.

(4) The following symbols are used to designate footnotes in the United States Table:

(i) Any footnote not prefixed by a letter, denotes an international footnote. Where such a footnote is applicable, without modification, to the United States Table, the symbol appears in the United States Table (column 4 or 5) and denotes a stipulation affecting both the Government and non-Government plans.

(ii) Any footnote consisting of the letters US followed by one or more digits, e.g., US, denotes a stipulation affecting both the Government and non-Government plans.

(iii) Any footnote consisting of the letters NG followed by one or more digits, e.g., NG1, denotes a stipulation applicable only to the non-Government plan (column 5).

(iv) Any footnote consisting of the letter G following by one or more digits, e.g., G1, denotes a stipulation applicable only to the Government plan (column 4).

(5) Column 6 provides a reference to indicate which Rule part(s) (e.g., Private Land Mobile Radio Services, Domestic Public Land Mobile Radio Services, etc.) are given assignments within the allocation plan specified in column 5 for any given band of frequencies. The exact use that can be made of any given frequency or frequencies (e.g., channelling plans, allowable emissions, etc.) is given in the Rule part(s) so indicated. The Rule parts in this column are not allocations. They are provided for informational purposes only.

(6) Column 7 is used to denote certain frequencies which have national and/or international significance.

[49 FR 2373, Jan. 19, 1984, as amended at 49 FR 44101, Nov. 2, 1984]

§ 2.106 Table of Frequency Allocations.

International table			United States table		FCC use designators	
			Government	Non-Government		
Region 1—allocation kHz	Region 2—allocation kHz	Region 3—allocation kHz	Allocation kHz	Allocation kHz	Rule part(s)	Special-use frequencies
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Below 9	(Not allocated) 444 445		Below 9 (Not allocated) 444 445	Below 9 (Not allocated) 444 445		
9–14	RADIONAVIGATION		9–14 RADIONAVIGATION US18 US294	9–14 RADIONAVIGATION US18 US294		
14–19.95	FIXED MARITIME MOBILE 448 446 447		14–19.95 FIXED MARITIME MOBILE 448 US294	14–19.95 Fixed 448 US294	INTERNATIONAL FIXED PUBLIC (23)	
19.95–20.05	STANDARD FREQUENCY AND TIME SIGNAL (20 kHz)		19.95–20.05 STANDARD FREQUENCY AND TIME SIGNAL US294	19.95–20.05 STANDARD FREQUENCY AND TIME SIGNAL US294		20 kHz Standard frequency
20.05–70	FIXED MARITIME MOBILE 448		20.05–59 FIXED MARITIME MOBILE 446 US294	20.05–59 FIXED 448 US294	INTERNATIONAL FIXED PUBLIC (23)	
			59–61 STANDARD FREQUENCY AND TIME SIGNAL US294	59–61 STANDARD FREQUENCY AND TIME SIGNAL US294		60 kHz Standard frequency
	447 449		61–70 FIXED MARITIME MOBILE 448 US294	61–70 FIXED 448 US294	INTERNATIONAL FIXED PUBLIC (23)	

International table			United States table		FCC use designators	
Region 1—allocation kHz	Region 2—allocation kHz	Region 3—allocation kHz	Government Allocation kHz	Non-Government Allocation kHz	Rule part(s)	Special-use frequencies
(1)	(2)	(3)	(4)	(5)	(6)	(7)
70–72 RADIONAVIGATION 451	70–90 FIXED MARITIME MOBILE 448 MARITIME RADIO-NAVIGATION 451 Radiolocation	70–72 RADIONAVIGATION 451 Fixed Maritime Mobile 448	70–90 FIXED MARITIME MOBILE Radiolocation	70–90 FIXED Radiolocation	INTERNATIONAL FIXED PUBLIC (23) Private Land Mobile (90)	
72–84 FIXED MARITIME MOBILE 448 RADIONAVIGATION 451 447		72–84 FIXED MARITIME MOBILE 448 RADIONAVIGATION 451				
84–86 RADIONAVIGATION 451		84–86 RADIONAVIGATION 451 Fixed Maritime Mobile 448 450				
86–90 FIXED MARITIME MOBILE 448 RADIONAVIGATION 447	452	86–90 FIXED MARITIME MOBILE 448 RADIONAVIGATION 451	448 451 US288 US294	448 451 US288 US294		
90–110	RADIONAVIGATION 453 Fixed 453A 454		90–110 RADIONAVIGATION 453 US18 US104 US294	90–110 RADIONAVIGATION 453 US18 US104 US294	Private Land Mobile (90)	
110–112 FIXED MARITIME MOBILE RADIONAVIGATION 454	110–130 FIXED MARITIME MOBILE MARITIME RADIO-NAVIGATION 451 Radiolocation	110–112 FIXED MARITIME MOBILE RADIONAVIGATION 451 454	110–130 FIXED MARITIME MOBILE Radiolocation	110–130 FIXED MARITIME MOBILE Radiolocation	INTERNATIONAL FIXED PUBLIC (23) MARITIME (80) Private Land Mobile (90)	

112–115 RADIONAVIGATION 451		112–117.6 RADIONAVIGATION 451 Fixed Maritime Mobile 454 455				
115–117.6 RADIONAVIGATION 451 Fixed Maritime Mobile 454 456						
117.6–126.0 FIXED MARITIME MOBILE RADIONAVIGATION 451 454		117.6–126.0 FIXED MARITIME MOBILE RADIONAVIGATION 451 454				
126–129 RADIONAVIGATION 451		126–129 RADIONAVIGATION 451 Fixed Maritime Mobile 454 455				
129–130 FIXED MARITIME MOBILE RADIONAVIGATION 451 454	452 454	129–130 FIXED MARITIME MOBILE RADIONAVIGATION 451 454	451 454 US294	451 454 US294		
130–148.5 MARITIME MOBILE /FIXED/ 454 457	130–160 FIXED MARITIME MOBILE 454	130–160 FIXED MARITIME MOBILE RADIONAVIGATION 454	130–160 FIXED MARITIME MOBILE 454 US294	130–160 FIXED MARITIME MOBILE 454 US294	INTERNATIONAL FIXED PUBLIC (23) MARITIME (80)	
148.5–255 BROADCASTING	160–190 FIXED 459	160–190 FIXED Aeronautical Radio-navigation	160–190 FIXED MARITIME MOBILE 459 US294	160–190 FIXED 459 US294	INTERNATIONAL FIXED PUBLIC (23) MARITIME (80)	
	190–200 AERONAUTICAL RADIO-NAVIGATION		190–200 AERONAUTICAL RADIO-NAVIGATION US18 US226 US294	190–200 AERONAUTICAL RADIO-NAVIGATION US18 US226 US294		

International table			United States table		FCC use designators	
Region 1—allocation kHz	Region 2—allocation kHz	Region 3—allocation kHz	Government Allocation kHz	Non-Government Allocation kHz	Rule part(s)	Special-use frequencies
(1)	(2)	(3)	(4)	(5)	(6)	(7)
460 461 462	200–275 AERONAUTICAL RADIO-NAVIGATION Aeronautical Mobile	200–285 AERONAUTICAL RADIO-NAVIGATION Aeronautical Mobile	200–275 AERONAUTICAL RADIO-NAVIGATION Aeronautical Mobile US18 US294	200–275 AERONAUTICAL RADIO-NAVIGATION Aeronautical Mobile US18 US294	AVIATION (87)	
255–283.5 BROADCASTING /AERONAUTICAL RADIONAVIGATION/ 463						
462 464 464A	275–285 AERONAUTICAL RADIO-NAVIGATION Aeronautical Mobile Maritime Radionavigation (radiobeacons)		275–285 AERONAUTICAL RADIO-NAVIGATION Aeronautical Mobile Maritime Radionavigation (radiobeacons) US18 US294	275–285 AERONAUTICAL RADIO-NAVIGATION Aeronautical Mobile Maritime Radionavigation (radiobeacons) US18 US294		
283.5–315 MARITIME RADIO-NAVIGATION (radiobeacons) 466 /AERONAUTICAL RADIONAVIGATION/						
464A 465 466A	285–315 MARITIME RADIO-NAVIGATION (radiobeacons) 466 /AERONAUTICAL RADIONAVIGATION/		285–325 MARITIME RADIO-NAVIGATION (radiobeacons) 466 Aeronautical Radio-navigation (radiobeacons)	285–325 MARITIME RADIO-NAVIGATION (radiobeacons) 466 Aeronautical Radio-navigation (radiobeacons)	AVIATION (87)	

315–325 AERONAUTICAL RADIO-NAVIGATION Maritime Radionavigation (radiobeacons) 466 465 467	315–325 MARITIME RADIO-NAVIGATION (radiobeacons) 466 Aeronautical Radio-navigation	315–325 AERONAUTICAL RADIO-NAVIGATION MARITIME RADIO-NAVIGATION (radiobeacons) 466	US18 US294	US18 US294		
325–405 AERONAUTICAL RADIO-NAVIGATION	325–335 AERONAUTICAL RADIO-NAVIGATION Aeronautical Mobile Maritime Radionavigation (radiobeacons)	325–405 AERONAUTICAL RADIO-NAVIGATION Aeronautical Mobile	325–335 AERONAUTICAL RADIO-NAVIGATION (radiobeacons) Aeronautical Mobile Maritime Radionavigation (radiobeacons) US18 US294	325–335 AERONAUTICAL RADIO-NAVIGATION (radiobeacons) Aeronautical Mobile Maritime Radionavigation (radiobeacons) US18 US294	AVIATION (87)	
465	335–405 AERONAUTICAL RADIO-NAVIGATION Aeronautical Mobile		335–405 AERONAUTICAL RADIO-NAVIGATION (radiobeacons) Aeronautical Mobile US18 US294	335–405 AERONAUTICAL RADIO-NAVIGATION (radiobeacons) Aeronautical Mobile US18 US294	AVIATION (87)	
405–415 RADIONAVIGATION 468 465	405–415 RADIONAVIGATION 468 Aeronautical Mobile		405–415 RADIONAVIGATION 468 Aeronautical Mobile US18 US294	405–415 RADIONAVIGATION 468 Aeronautical Mobile US18 US294	AVIATION (87)	
415–435 AERONAUTICAL RADIO-NAVIGATION /MARITIME MOBILE/ 470 465	415–495 MARITIME MOBILE 470 AERONAUTICAL RADIO-NAVIGATION 470A	415–435 MARITIME MOBILE 470 AERONAUTICAL RADIO-NAVIGATION 470A	415–435 AERONAUTICAL RADIO-NAVIGATION MARITIME MOBILE 470 469A US294	415–435 AERONAUTICAL RADIO-NAVIGATION MARITIME MOBILE 470 469A US294	AVIATION (87) MARITIME (80)	
435–495 MARITIME MOBILE 470 Aeronautical Radio-navigation 465 471 472A	469 469A 471 472A	469 469A 471 472A	435–495 MARITIME MOBILE 470 AERONAUTICAL RADIO-NAVIGATION 471 472A US231 US294	435–495 MARITIME MOBILE 470 471 472A US231 US294	MARITIME (80)	
495–505	MOBILE (distress and calling) 472		495–505 MOBILE (distress and calling) 472	495–505 MOBILE (distress and calling) 472	MARITIME (80)	500 kHz: Distress and calling frequency

International table			United States table		FCC use designators	
Region 1—allocation kHz	Region 2—allocation kHz	Region 3—allocation kHz	Government Allocation kHz	Non-Government Allocation kHz	Rule part(s)	Special-use frequencies
(1)	(2)	(3)	(4)	(5)	(6)	(7)
505–526.5 MARITIME MOBILE 470 /AERONAUTICAL RADIONAVIGATION/ 465 471 474 475 476	505–510 MARITIME MOBILE 470 471	505–526.5 MARITIME MOBILE 470 474 /AERONAUTICAL RADIONAVIGATION/ Aeronautical Mobile Land Mobile 471	505–510 MARITIME MOBILE 470 471	505–510 MARITIME MOBILE 470 471	MARITIME (80)	
	510–525 MOBILE 474 AERONAUTICAL RADIO-NAVIGATION		510–525 AERONAUTICAL RADIO-NAVIGATION (radiobeacons) MARITIME MOBILE (Ships only) 474 US14 US18 US225	510–525 AERONAUTICAL RADIO-NAVIGATION (radiobeacons) MARITIME MOBILE (Ships only) 474 US14 US18 US225	AVIATION (87) MARITIME (80)	518 kHz is used for inter-national NAVTEX in the Mar-itime Mo-bile Serv-ice
	525–535 BROADCASTING 477 AERONAUTICAL RADIO-NAVIGATION		525–535 MOBILE AERONAUTICAL RADIO-NAVIGATION (radiobeacons) US18 US221 US239	525–535 MOBILE AERONAUTICAL RADIO-NAVIGATION (radiobeacons) US18 US221 US239	AVIATION (87) PRIVATE LAND MOBILE (90)	530 kHz: Travelers information
526.5–1606.5 BROADCASTING 478		526.5–535 BROADCASTING Mobile 479				

	535–1605 BROADCASTING	535–1606.5 BROADCASTING	535–1605	535–1705 BROADCASTING 480 Alaska Fixed (80) Auxiliary Broadcasting (74) Private Land Mobile (90)	RADIO BROADCASTING (AM) (73)	535–1705 kHz: Travelers information
	1605–1625 BROADCASTING 480		1605–1615 Mobile US221			
1606.5–1625 MARITIME MOBILE 480A /FIXED/ /LAND MOBILE/ 483 484	480A 481	1606.5–1800 FIXED MOBILE RADIOLOCATION RADIONAVIGATION 482	1615–1625 US 237 US299			
1625–1635 RADIOLOCATION 487 485 486	1625–1705 BROADCASTING /FIXED/ /MOBILE/ Radiolocation 480A		1625–1705 Radiolocation 480			
1635–1800 MARITIME MOBILE /FIXED/ /LAND MOBILE/ 480A	481		US238 US299	US238 US299 US321 NG128		
483 484 488	1705–1800 FIXED MOBILE RADIOLOCATION AERONAUTICAL RADIONAVIGATION		1705–1800 FIXED MOBILE RADIOLOCATION US240	1705–1800 FIXED MOBILE RADIOLOCATION US240	DISASTER (99) INTERNATIONAL FIXED PUBLIC (23) MARITIME (80) PRIVATE LAND MOBILE (90)	

International table			United States table		FCC use designators	
Region 1—allocation kHz	Region 2—allocation kHz	Region 3—allocation kHz	Government Allocation kHz	Non-Government Allocation kHz	Rule part(s)	Special-use frequencies
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1800–1810 RADIOLOCATION 487 485 486	1800–1850 AMATEUR	1800–2000 AMATEUR FIXED MOBILE except aeronautical mobile RADIONAVIGATION Radiolocation	1800–1900	1800–1900 AMATEUR	AMATEUR (97)	
1810–1850 AMATEUR 490 491 492 493						
1850–2000 FIXED MOBILE except aeronautical mobile 484 488 495	1850–2000 AMATEUR FIXED MOBILE except aeronautical mobile RADIOLOCATION RADIONAVIGATION 494	489	1900–2000 RADIOLOCATION US290	1900–2000 RADIOLOCATION US290	PRIVATE LAND MOBILE (90) Amateur (97)	
2000–2025 FIXED MOBILE except aeronautical mobile (R) 484 495	2000–2065 FIXED MOBILE		2000–2065 FIXED MOBILE	2000–2065 MARITIME MOBILE	MARITIME (80)	
2025–2045 FIXED MOBILE except aeronautical mobile (R) Meteorological Aids 496 484 495						

2045–2160 MARITIME MOBILE /FIXED/ /LAND MOBIL/			NG19			
	2065–2107 MARITIME MOBILE 497 498		2065–2107 MARITIME MOBILE 497	2065–2107 MARITIME MOBILE 497	MARITIME (80)	
483 484	2107–2170 FIXED MOBILE		2107–2170 FIXED MOBILE	2107–2170 FIXED MARITIME MOBILE LAND MOBILE	AVIATION (87) INTERNATIONAL FIXED PUBLIC (23) MARITIME (80) PRIVATE LAND MOBILE (90)	
2160–2170 RADIOLOCATION 487 485 486 499				NG19		
2170.0–2173.5	MARITIME MOBILE		2170–2173.5 MARITIME MOBILE	2170–2173.5 MARITIME MOBILE	MARITIME (80)	
2173.5–2190.5	MOBILE (distress and calling) 500 501 500A 500B	MOBILE (distress and calling) 500 501 500A 500B	2173.5–2190.5 MOBILE (distress and calling) 500 501 US279 500A 500B	2173.5–2190.5 MOBILE (distress and calling) 500 501 US279 500A 500B	AVIATION (87) MARITIME (80)	2182 kHz: Distress and calling
2190.5–2194.0	MARITIME MOBILE		2190.5–2194 MARITIME MOBILE	2190.5–2194 MARITIME MOBILE	MARITIME (80)	
2194–2300 FIXED MOBILE except aeronautical mobile (R) 484 495 502	2194–2300 FIXED MOBILE 502		2194–2495 FIXED MOBILE	2194–2495 FIXED LAND MOBILE MARITIME MOBILE	AVIATION (87) INTERNATIONAL FIXED PUBLIC (23) MARITIME (80) PRIVATE LAND MOBILE (90)	

International table			United States table		FCC use designators	
Region 1—allocation kHz	Region 2—allocation kHz	Region 3—allocation kHz	Government Allocation kHz	Non-Government Allocation kHz	Rule part(s)	Special-use frequencies
(1)	(2)	(3)	(4)	(5)	(6)	(7)
2300–2498 FIXED MOBILE except aeronautical mobile (R) BROADCASTING 503	2300–2495 FIXED MOBILE BROADCASTING 503			NG19		
495	2495–2501 STANDARD FREQUENCY AND TIME SIGNAL (2500 kHz)		2495–2505 STANDARD FREQUENCY AND TIME SIGNAL (2500 kHz) G106	2495–2505 STANDARD FREQUENCY AND TIME SIGNAL (2500 kHz)		2500 kHz: Standard frequency
2498–2501 STANDARD FREQUENCY AND TIME SIGNAL (2500 kHz)						
2501–2502	STANDARD FREQUENCY AND TIME SIGNAL Space Research					
2502–2625 FIXED MOBILE except aeronautical mobile (R)	2502–2505 STANDARD FREQUENCY AND TIME SIGNAL					
484 495 504	2505–2850 FIXED MOBILE		2505–2850 FIXED MOBILE	2505–2850 FIXED LAND MOBILE MARITIME MOBILE	AVIATION (87) INTERNATIONAL FIXED PUBLIC (23) MARITIME (80) PRIVATE LAND MOBILE (90)	

2625–2650 MARITIME MOBILE MARITIME RADIO-NAVIGATION 484						
2650–2850 FIXED MOBILE except aeronautical mobile (R) 484 495			US285	US285		
2850–3025	AERONAUTICAL MOBILE (R) 501 505		2850–3025 AERONAUTICAL MOBILE (R) 501 505 US283	2850–3025 AERONAUTICAL MOBILE (R) 501 505 US283	AVIATION (87)	
3025–3155	AERONAUTICAL MOBILE (OR)		3025–3155 AERONAUTICAL MOBILE (OR)	3025–3155 AERONAUTICAL MOBILE (OR)		
3155–3200	FIXED MOBILE except aeronautical mobile (R) 506 507		3155–3230 FIXED MOBILE except aeronautical mobile (R)	3155–3230 FIXED MOBILE except aeronautical mobile (R)	AVIATION (87) INTERNATIONAL FIXED PUBLIC (23) MARITIME (80) PRIVATE LAND MOBILE (90)	
3200–3230	FIXED MOBILE except aeronautical mobile (R) BROADCASTING 503 506					
3230–3400	FIXED MOBILE except aeronautical mobile BROADCASTING 503 506 508		3230–3400 FIXED MOBILE except aeronautical mobile Radiolocation	3230–3400 FIXED MOBILE except aeronautical mobile Radiolocation	AVIATION (87) INTERNATIONAL FIXED PUBLIC (23) MARITIME (80) PRIVATE LAND MOBILE (90)	
3400–3500	AERONAUTICAL MOBILE (R)		3400–3500 AERONAUTICAL MOBILE (R)	3400–3500 AERONAUTICAL MOBILE (R)	AVIATION (87)	

International table			United States table		FCC use designators	
Region 1—allocation kHz	Region 2—allocation kHz	Region 3—allocation kHz	Government Allocation kHz	Non-Government Allocation kHz	Rule part(s)	Special-use frequencies
(1)	(2)	(3)	(4)	(5)	(6)	(7)
			US283	US283		
3500–3800 AMATEUR 510 FIXED MOBILE except aeronautical mobile 484	3500–3750 AMATEUR 510 509 511	3500–3900 AMATEUR 510 FIXED MOBILE	3500–4000 510	3500–4000 AMATEUR 510	AMATEUR (97)	
	3750–4000 AMATEUR 510 FIXED MOBILE except aeronautical mobile (R)					
3800–3900 FIXED AERONAUTICAL MOBILE (OR) LAND MOBILE						
3900–3950 AERONAUTICAL MOBILE (OR) 513		3900–3950 AERONAUTICAL MOBILE BROADCASTING				
3950–4000 FIXED BROADCASTING	511 512 514 515	3950–4000 FIXED BROADCASTING 516				
4000–4063	FIXED MARITIME MOBILE 517 516		4000–4438 MARITIME MOBILE 500A 500B 520 520B	4000–4438 MARITIME MOBILE 500A 500B 520 520B	INTERNATIONAL FIXED PUBLIC (23) MARITIME (80)	
4063–4438	MARITIME MOBILE					

	500A 500B 518 519 520 520A 520B		US82 US236 US296	US82 US236 US296		
4438–4650 FIXED MOBILE except aeronautical mobile (R)		4438–4650 FIXED MOBILE except aeronautical mobile	4438–4650 FIXED MOBILE except aeronautical mobile (R)	4438–4650 FIXED MOBILE except aeronautical mobile (R)	AVIATION (87) INTERNATIONAL FIXED PUBLIC (23) MARITIME (80) PRIVATE LAND MOBILE (90)	
4650–4700	AERONAUTICAL MOBILE (R)		4650–4700 AERONAUTICAL MOBILE (R) US282 US283	4650–4700 AERONAUTICAL MOBILE (R) US282 US283	AVIATION (87)	
4700–4750	AERONAUTICAL MOBILE (OR)		4700–4750 AERONAUTICAL MOBILE (OR)	4700–4750 AERONAUTICAL MOBILE (OR)		
4750–4850 FIXED AERONAUTICAL MOBILE (OR) LAND MOBILE BROADCASTING 503	4750–4850 FIXED MOBILE except aeronautical BROADCASTING 503	4750–4850 FIXED BROADCASTING 503 Land Mobile	4750–4850 FIXED MOBILE except aeronautical mobile	4750–4850 FIXED MOBILE except aeronautical mobile (R)	AVIATION (87) INTERNATIONAL FIXED PUBLIC (23) MARITIME (80)	
4850–4995	FIXED LAND MOBILE BROADCASTING 503		4850–4995 FIXED MOBILE	4850–4995 FIXED	AVIATION (87) INTERNATIONAL FIXED PUBLIC (23) MARITIME (80)	
4995–5003	STANDARD FREQUENCY AND TIME SIGNAL (5000 kHz)		4995–5005 STANDARD FREQUENCY AND TIME SIGNAL	4995–5005 STANDARD FREQUENCY AND TIME SIGNAL		5000 kHz: Standard frequency
5003–5005	STANDARD FREQUENCY AND TIME SIGNAL Space Research		G106			

International table			United States table		FCC use designators	
Region 1—allocation kHz	Region 2—allocation kHz	Region 3—allocation kHz	Government Allocation kHz	Non-Government Allocation kHz	Rule part(s)	Special-use frequencies
(1)	(2)	(3)	(4)	(5)	(6)	(7)
5005–5060	FIXED BROADCASTING 503		5005–5060 FIXED	5005–5060 FIXED	AVIATION (87) INTERNATIONAL FIXED PUBLIC (23) MARITIME (80) PRIVATE LAND MOBILE (90)	
5060–5250	FIXED Mobile except aeronautical mobile 521		5060–5450 FIXED MOBILE except aeronautical mobile US212	5060–5450 FIXED MOBILE except aeronautical mobile US212	AVIATION (87) INTERNATIONAL FIXED PUBLIC (23) MARITIME (80) PRIVATE LAND MOBILE (90)	
5250–5450	FIXED MOBILE except aeronautical mobile					
5450–5480 FIXED AERONAUTICAL MOBILE (OR) LAND MOBILE	5450–5480 AERONAUTICAL MOBILE (R)	5450–5480 FIXED AERONAUTICAL MOBILE (OR) LAND MOBILE	5450–5680 AERONAUTICAL MOBILE (R) 501 505 US283	5450–5680 AERONAUTICAL MOBILE (R) 501 505 US283	AVIATION (87)	
5480–5680	AERONAUTICAL MOBILE (R) 501 505					
5680–5730	AERONAUTICAL MOBILE (OR) 501 505		5680–5730 AERONAUTICAL MOBILE (OR) 501 505	5680–5730 AERONAUTICAL MOBILE (OR) 501 505		

5730–5950 FIXED LAND MOBILE	5730–5950 FIXED MOBILE except aeronautical mobile (R)	5730–5950 FIXED MOBILE except aeronautical mobile (R)	5730–5950 FIXED MOBILE except aeronautical mobile (R)	5730–5950 FIXED MOBILE except aeronautical mobile (R)	AVIATION (87) INTERNATIONAL FIXED PUBLIC (23) MARITIME (80)	
5950–6200	BROADCASTING		5950–6200 BROADCASTING US280	5950–6200 BROADCASTING US280	RADIO BROADCAST (HF) (73)	
6200–6525	MARITIME MOBILE 500A 500B 520 520B 522		6200–6525 MARITIME MOBILE 500A 500B 520 520B US82 US296	6200–6525 MARITIME MOBILE 500A 500B 520 520B US82 US296	MARITIME (80)	
6525–6685	AERONAUTICAL MOBILE (R)		6525–6685 AERONAUTICAL MOBILE (R) US283	6525–6685 AERONAUTICAL MOBILE (R) US283	AVIATION (87)	
6685–6765	AERONAUTICAL MOBILE (OR)		6685–6765 AERONAUTICAL MOBILE (OR)	6685–6765 AERONAUTICAL MOBILE (OR)		
6765–7000	FIXED Land Mobile 525 524		6765–7000 FIXED Mobile 524	6765–7000 FIXED Mobile 524	AVIATION (87) INTERNATIONAL FIXED PUBLIC (23)	6780+15 kHz: Industrial, scientific, and medical frequency
7000–7100	AMATEUR 510 AMATEUR-SATELLITE 526 527		7000–7300 510 528	7000–7100 AMATEUR 510 AMATEUR-SATELLITE	AMATEUR (97)	
7100–7300 BROADCASTING	7100–7300 AMATEUR 510 528	7100–7300 BROADCASTING		7100–7300 AMATEUR 510 528	AMATEUR (97)	

International table			United States table		FCC use designators	
Region 1—allocation kHz	Region 2—allocation kHz	Region 3—allocation kHz	Government Allocation kHz	Non-Government Allocation kHz	Rule part(s)	Special-use frequencies
(1)	(2)	(3)	(4)	(5)	(6)	(7)
7300–8100	FIXED Land Mobile 529		7300–8100 FIXED Mobile	7300–8100 FIXED Mobile	AVIATION (87) INTERNATIONAL FIXED PUBLIC (23) MARITIME (80) PRIVATE LAND MOBILE (90)	
8100–8195	FIXED MARTIME MOBILE		8100–8815 MARITIME MOBILE 500A 500B 520B 529A	8100–8815 MARITIME mobile 500A 500B 520B 529A	MARITIME (80)	
8195–8815	MARITIME MOBILE 500A 500B 520B 529A 501		501 US82 US236 US296	501 US82 US236 US296		
8815–8965	AERONAUTICAL MOBILE (R)		8815–8965 AERONAUTICAL MOBILE (R)	8815–8965 AERONAUTICAL MOBILE (R)	Aviation (87)	
8965–9040	AERONAUTICAL MOBILE (OR)		8965–9040 AERONAUTICAL MOBILE (OR)	8965–9040 AERONAUTICAL MOBILE (OR)		
9040–9500	FIXED		9040–9500 FIXED	9040–9050 FIXED	Aviation (87) INTERNATIONAL FIXED PUBLIC (23) MARITIME (80)	
9500–9900	BROADCASTING 530 531		9500–9900 BROADCASTING US235	9500–9900 BROADCASTING US235	RADIO BROADCAST (HF) (73) INTERNATIONAL FIXED PUBLIC (23)	

9900–9995	FIXED		9900–9995 FIXED	9900–9995 FIXED	AVIATION (87) INTERNATIONAL FIXED PUBLIC (23)	
9995–10003	STANDARD FREQUENCY AND TIME SIGNAL (10000 kHz) 501		9995–10005 STANDARD FREQUENCY AND TIME SIGNAL	9995–10005 STANDARD FREQUENCY AND TIME SIGNAL		10000 kHz: Standard frequency
10003–10005	STANDARD FREQUENCY AND TIME SIGNAL Space Research 501		501 G106	501		
10005–10100	AERONAUTICAL MOBILE (R) 501		10005–10100 AERONAUTICAL MOBILE (R) 501 US283	10005–10100 AERONAUTICAL MOBILE (R) 501 US283	AVIATION (87)	
10100–10150	FIXED Amateur 510		10100–10150 510 US247	10100–10150 AMATEUR 510 US247	AMATEUR (97)	
10150–11175	FIXED MOBILE except aeronautical mobile (R)		10150–11175 FIXED MOBILE except aeronautical mobile (R)	10150–11175 FIXED MOBILE except aeronautical mobile (R)	10150–11175 AVIATION (87) INTERNATIONAL FIXED PUBLIC (23)	
11175–11275	AERONAUTICAL MOBILE (OR)		11175–11275 AERONAUTICAL MOBILE (OR)	11175–11275 AERONAUTICAL MOBILE (OR)		
11275–11400	AERONAUTICAL MOBILE (R)		11275–11400 AERONAUTICAL MOBILE (R) US283	11275–11400 AERONAUTICAL MOBILE (R) US283	AVIATION (87)	
11400–11650	FIXED		11400–11650 FIXED	11400–11650 FIXED	AVIATION (87) INTERNATIONAL FIXED PUBLIC (23)	

International table			United States table		FCC use designators	
			Government	Non-Government		
Region 1—allocation kHz	Region 2—allocation kHz	Region 3—allocation kHz	Allocation kHz	Allocation kHz	Rule part(s)	Special-use frequencies
(1)	(2)	(3)	(4)	(5)	(6)	(7)
11650–12050	BROADCASTING 530 531		11650–12050 BROADCASTING US235	11650–12050 BROADCASTING US235	RADIO BROADCAST (HF) (73) INTERNATIONAL FIXED PUBLIC (23)	
12050–12230	FIXED		12050–12230 FIXED	12050–12230 FIXED	AVIATION (87) INTERNATIONAL FIXED PUBLIC (23)	
12230–13200	MARITIME MOBILE 500A 500B 520B 529A 532		12230–13200 MARITIME MOBILE 500A 500B 520B 529A US82 US296	12230–13200 MARITIME MOBILE 500A 500B 520B 529A US82 US296	INTERNATIONAL FIXED PUBLIC (23) MARITIME (80)	
13200–13260	AERONAUTICAL MOBILE (OR)		13200–13260 AERONAUTICAL MOBILE (OR)	13200–13260 AERONAUTICAL MOBILE (OR)		
13260–13360	AERONAUTICAL MOBILE (R)		13260–13360 AERONAUTICAL MOBILE (R) US283	13260–13360 AERONAUTICAL MOBILE (R) US283	AVIATION (87)	
13360–13410	FIXED RADIO ASTRONOMY 533		13360–13410 RADIO ASTRONOMY 533 G115	13360–13410 RADIO ASTRONOMY 533		
13410–13600	FIXED Mobile except aeronautical mobile (R) 534		13410–13600 FIXED Mobile except aeronautical mobile (R) 534	13410–13600 FIXED 534	AVIATION (87) INTERNATIONAL FIXED PUBLIC (23)	13560±7 kHz: Industrial, scientific, and medical frequency

13600–13800	BROADCASTING 531		13600–13800 BROADCASTING US235	13600–13800 BROADCASTING US235	RADIO BROADCAST (HF) (73) INTERNATIONAL FIXED PUBLIC (23)	
13800–14000	FIXED Mobile except aeronautical mobile (R)		13800–14000 FIXED Mobile except aeronautical mobile (R)	13800–14000 FIXED	AVIATION (87) INTERNATIONAL FIXED PUBLIC (23)	
14000–14250	AMATEUR 510 AMATEUR-SATELLITE		14000–14350 510	14000–14250 AMATEUR 510 AMATEUR-SATELLITE	AMATEUR (97)	
14250–14350	AMATEUR 510 535			14250–14350 AMATEUR 510	AMATEUR (97)	
14350–14990	FIXED Mobile except aeronautical mobile (R)		14350–14990 FIXED Mobile except aeronautical mobile (R)	14350–14990 FIXED	AVIATION (87) INTERNATIONAL FIXED PUBLIC (23)	
14990–15005	STANDARD FREQUENCY AND TIME SIGNAL (15000 kHz) 501		14990–15010 STANDARD FREQUENCY AND TIME SIGNAL 501 G106	14990–15010 STANDARD FREQUENCY AND TIME SIGNAL 501		15000 kHz: Standard frequency
15005–15010	STANDARD FREQUENCY AND TIME SIGNAL Space Research					
15010–15100	AERONAUTICAL MOBILE (OR)		15010–15100 AERONAUTICAL MOBILE (OR)	15010–15100 AERONAUTICAL MOBILE (OR)		
15100–15600	BROADCASTING 531		15100–15600 BROADCASTING US235	15100–15600 BROADCASTING US235	RADIO BROADCAST (HF) (73) INTERNATIONAL FIXED PUBLIC (23)	

International table			United States table		FCC use designators	
Region 1—allocation kHz	Region 2—allocation kHz	Region 3—allocation kHz	Government Allocation kHz	Non-Government Allocation kHz	Rule part(s)	Special-use frequencies
(1)	(2)	(3)	(4)	(5)	(6)	(7)
15600–16360	FIXED 536		15600–16360 FIXED	15600–16360 FIXED	AVIATION (87) INTERNATIONAL FIXED PUBLIC (23)	
16360–17410	MARITIME MOBILE 500A 500B 520B 529A 532		16360–17410 MARITIME MOBILE 500A 500B 520B 529A US82 US296	16360–17410 MARITIME MOBILE 500A 500B 520B 529A US82 US296	MARITIME (80)	
17410–17550	FIXED		17410–17550 FIXED	17410–17550 FIXED	AVIATION (87) INTERNATIONAL FIXED PUBLIC (23)	
17550–17900	BROADCASTING 531		17550–17900 BROADCASTING US235	17550–17900 BROADCASTING US235	RADIO BROADCAST (HF) (73) INTERNATIONAL FIXED PUBLIC (23)	
17900–17970	AERONAUTICAL MOBILE (R)		17900–17970 AERONAUTICAL MOBILE (R) US283	17900–17970 AERONAUTICAL MOBILE (R) US283	AVIATION (87)	
17970–18030	AERONAUTICAL MOBILE (OR)		17970–18030 AERONAUTICAL MOBILE (OR)	17970–18030 AERONAUTICAL MOBILE (OR)		
18030–18052	FIXED		18030–18068 FIXED	18030–18068 FIXED	INTERNATIONAL FIXED PUBLIC (23) MARITIME (80)	
18052–18068	FIXED Space Research					

18068–18168	AMATEUR 510 AMATEUR-SATELLITE 537 538		18068–18168 510 US248	18068–18168 AMATEUR 510 AMATEUR-SATELLITE US248	AMATEUR (97) INTERNATIONAL FIXED PUBLIC (23) MARITIME (80)	
18168–18780	FIXED Mobile except aeronautical mobile		18168–18780 FIXED Mobile	18168–18780 FIXED Mobile	AVIATION (87) INTERNATIONAL FIXED PUBLIC (23) MARITIME (80)	
18780–18900	MARITIME MOBILE 532		18780–18900 MARITIME MOBILE US82 US296	18780–18900 MARITIME MOBILE US82 US296	INTERNATIONAL FIXED PUBLIC (23) MARITIME (80)	
18900–19680	FIXED		18900–19680 FIXED	18900–19680 FIXED	AVIATION (87) INTERNATIONAL FIXED PUBLIC (23)	
19680–19800	MARITIME MOBILE 520B 532		19680–19800 MARITIME MOBILE 520B	19680–19800 MARITIME MOBILE 520B	MARITIME (80)	
19800–19990	FIXED		19800–19990 FIXED	19800–19990 FIXED	AVIATION (87) INTERNATIONAL FIXED PUBLIC (23)	
19990–19995	STANDARD FREQUENCY AND TIME SIGNAL Space Research 501		19990–20010 STANDARD FREQUENCY AND TIME SIGNAL 501 G106	19990–20010 STANDARD FREQUENCY AND TIME SIGNAL 501		20000 kHz: Standard frequency
19995–20010	STANDARD FREQUENCY AND TIME SIGNAL (20000 kHz) 501					

International table			United States table		FCC use designators	
Region 1—allocation kHz	Region 2—allocation kHz	Region 3—allocation kHz	Government Allocation kHz	Non-Government Allocation kHz	Rule part(s)	Special-use frequencies
(1)	(2)	(3)	(4)	(5)	(6)	(7)
20010–21000	FIXED Mobile		20010–21000 FIXED Mobile	20010–21000 FIXED		
21000–21450	AMATEUR 510 AMATEUR-SATELLITE		21000–21450 510	21000–21450 AMATEUR 510 AMATEUR-SATELLITE	AMATEUR (97)	
21450–21850	BROADCASTING 531		21450–21850 BROADCASTING US235	21450–21850 BROADCASTING US235	INTERNATIONAL FIXED PUBLIC (23) RADIO BROADCAST (HF) (73)	
21850–21870	FIXED 539		21850–21924 FIXED	21850–21924 FIXED	AVIATION (87) INTERNATIONAL FIXED PUBLIC (23)	
21870–21924	AERONAUTICAL FIXED					
21924–22000	AERONAUTICAL MOBILE (R)		21924–22000 AERONAUTICAL MOBILE (R)	21924–22000 AERONAUTICAL MOBILE (R)	AVIATION (87)	
22000–22855	MARITIME MOBILE 520B 532 540		22000–22855 MARITIME MOBILE 520B US82 US296	22000–22855 MARITIME MOBILE 520B US82 US296	INTERNATIONAL FIXED PUBLIC (23) MARITIME (80)	
22855–23000	FIXED 540		22855–23000 FIXED	22855–23000 FIXED	AVIATION (87) INTERNATIONAL FIXED PUBLIC (23)	

23000–23200	FIXED Mobile except aeronautical mobile (R) 540		23000–23200 FIXED Mobile except aeronautical mobile (R)	23000–23200 FIXED	AVIATION (87) INTERNATIONAL FIXED PUBLIC (23)	
23200–23350	AERONAUTICAL FIXED AERONAUTICAL MOBILE (OR)		23200–23350 AERONAUTICAL MOBILE (OR)	23200–23350 AERONAUTICAL MOBILE (OR)		
23350–24000	FIXED MOBILE except aeronautical mobile 541 542		23350–24890 FIXED MOBILE except aeronautical mobile	23350–24890 FIXED	AVIATION (87) INTERNATIONAL FIXED PUBLIC (23)	
24000–24890	FIXED LAND MOBILE 542					
24890–24990	AMATEUR 510 AMATEUR-SATELLITE 542 543		24890–24990 510 US248	24890–24990 AMATEUR 510 AMATEUR-SATELLITE US248	AMATEUR (97)	
24990–25005	STANDARD FREQUENCY AND TIME SIGNAL (25000 kHz)		24990–25010 STANDARD FREQUENCY AND TIME SIGNAL G106	24990–25010 STANDARD FREQUENCY AND TIME SIGNAL		25000 kHz: Standard frequency
25005–25010	STANDARD FREQUENCY AND TIME SIGNAL Space Research					
25010–25070	FIXED MOBILE except aeronautical mobile		25010–25070	25010–25070 LAND MOBILE NG112	PRIVATE LAND MOBILE (90)	
25070–25210	MARITIME MOBILE		25070–25210 MARITIME MOBILE	25070–25210 MARITIME MOBILE US82 US281 US296	MARITIME (80) PRIVATE LAND MOBILE (90)	

International table			United States table		FCC use designators	
Region 1—allocation kHz	Region 2—allocation kHz	Region 3—allocation kHz	Government Allocation kHz	Non-Government Allocation kHz	Rule part(s)	Special-use frequencies
(1)	(2)	(3)	(4)	(5)	(6)	(7)
	544		US82 US281 US296	NG112		
25210–25550	FIXED MOBILE except aeronautical mobile		25210–25330	25210–25330 LAND MOBILE	PRIVATE LAND MOBILE (90)	
			25330–25550 FIXED MOBILE except aeronautical mobile	25330–25550		
25550–25670	RADIO ASTRONOMY 545		25550–25670 RADIO ASTRONOMY 545 US74	25550–25670 RADIO ASTRONOMY 545 US74		
25670–26100	BROADCASTING		25670–26100 BROADCASTING US25	25670–26100 BROADCASTING US25	AUXILIARY BROADCASTING (74) RADIO BROADCAST (HF) (73)	
26100–26175	MARITIME MOBILE 520B 544		26100–26175 MARITIME MOBILE 520B	26100–26175 MARITIME MOBILE 520B	AUXILIARY BROADCASTING (74) MARITIME (80)	
26175–26480 FIXED MOBILE except aeronautical mobile	26175–26480 FIXED MOBILE except aeronautical mobile	26175–26480 FIXED MOBILE except aeronautical mobile	26175–26480	26175–26480 LAND MOBILE	AUXILIARY BROADCASTING (74)	
26480–26950 FIXED MOBILE except aeronautical mobile	26480–26950 FIXED MOBILE except aeronautical mobile	26480–26950 FIXED MOBILE except aeronautical mobile	26480–26950 FIXED MOBILE except aeronautical mobile US10	26480–26950 US10		

26950–26960 FIXED MOBILE except aeronautical mobile 546	26950–26960 FIXED MOBILE except aeronautical mobile 546	26950–26960 FIXED MOBILE except aeronautical mobile 546	26950–26960 546	26950–26960 FIXED 546	INTERNATIONAL FIXED PUBLIC (23)	
26960–27230 FIXED MOBILE except aeronautical mobile 546	26960–27230 FIXED MOBILE except aeronautical mobile 546	26960–27230 FIXED MOBILE except aeronautical mobile 546	26960–26230 546	26960–27230 MOBILE except aeronautical mobile 546	PERSONAL (95)	27120±160 kHz: Industrial, scientific, and medical frequency.
27230–27410 FIXED MOBILE except aeronautical mobile 546	27230–27410 FIXED MOBILE except aeronautical mobile 546	27230–27410 FIXED MOBILE except aeronautical mobile 546	27230–27410 546	27230–27410 FIXED MOBILE except aeronautical mobile 546	PERSONAL (95) PRIVATE LAND MOBILE (90)	
27410–27500 FIXED MOBILE except aeronautical mobile	27410–27500 FIXED MOBILE except aeronautical mobile	27410–27500 FIXED MOBILE except aeronautical mobile	27410–27500	27410–27500 FIXED LAND MOBILE	PRIVATE LAND MOBILE (90)	
27500–27540 METEOROLOGICAL AIDS FIXED MOBILE	27500–27540 METEOROLOGICAL AIDS FIXED MOBILE	27500–27540 METEOROLOGICAL AIDS FIXED MOBILE	27500–27540	27500–27540 FIXED LAND MOBILE	PRIVATE LAND MOBILE (90)	
27540–28000 METEOROLOGICAL AIDS FIXED MOBILE	27540–28000 METEOROLOGICAL AIDS FIXED MOBILE	27540–28000 METEOROLOGICAL AIDS FIXED MOBILE	27540–28000 FIXED MOBILE	27540–28000		

International table			United States table		FCC use designators	
Region 1—allocation MHz	Region 2—allocation MHz	Region 3—allocation MHz	Government Allocation MHz	Non-Government Allocation MHz	Rule part(s)	Special-use frequencies
(1)	(2)	(3)	(4)	(5)	(6)	(7)
28.0–29.7	AMATEUR AMATEUR-SATELLITE		28.0–29.7	28.0–29.7 AMATEUR AMATEUR-SATELLITE	AMATEUR (97)	
29.7–29.8 FIXED MOBILE	29.7–29.8 FIXED MOBILE	29.7–29.8 FIXED MOBILE	29.7–29.8	29.7–29.8 LAND MOBILE	PRIVATE LAND MOBILE (90)	
29.8–29.89 FIXED MOBILE	29.8–29.89 FIXED MOBILE	29.8–29.89 FIXED MOBILE	29.8–29.89	29.8–29.89 FIXED	AVIATION (87) INTERNATIONAL FIXED PUBLIC (23)	
29.89–29.91 FIXED MOBILE	29.89–29.91 FIXED MOBILE	29.89–29.91 FIXED MOBILE	29.89–29.91 FIXED MOBILE	29.89–29.91		
29.91–30 FIXED MOBILE	29.91–30 FIXED MOBILE	29.91–30 FIXED MOBILE	29.91–30	29.91–30 FIXED	AVIATION (87) INTERNATIONAL FIXED PUBLIC (23)	
30–30.005 FIXED MOBILE	30–30.005 FIXED MOBILE	30–30.005 FIXED MOBILE	30–30.005 FIXED MOBILE	30–30.005		
30.005–30.01 SPACE OPERATIONS (satellite identification) FIXED MOBILE SPACE RESEARCH	30.005–30.01 SPACE OPERATIONS (satellite identification) FIXED MOBILE SPACE RESEARCH	30.005–30.01 SPACE OPERATIONS (satellite identification) FIXED MOBILE SPACE RESEARCH	30.005–30.01 FIXED MOBILE	30.005–30.01		
30.01–30.56 FIXED MOBILE	30.01–30.56 FIXED MOBILE	30.01–30.56 FIXED MOBILE	30.01–30.56 FIXED MOBILE	30.01–30.56		
30.56–32 FIXED MOBILE	30.56–32 FIXED MOBILE	30.56–32 FIXED MOBILE	30.56–32	30.56–32 FIXED LAND MOBILE NG124	PRIVATE LAND MOBILE (90)	

32–33 FIXED MOBILE	32–33 FIXED MOBILE	32–33 FIXED MOBILE	32–33 FIXED MOBILE	32–33		
33–34 FIXED MOBILE	33–34 FIXED MOBILE	33–34 FIXED MOBILE	33–34	33–34 FIXED LAND MOBILE NG124	PRIVATE LAND MOBILE (90)	
34–35 FIXED MOBILE	34–35 FIXED MOBILE	34–35 FIXED MOBILE	34–35 FIXED MOBILE	34–35		
35–35.19 FIXED MOBILE	35–35.19 FIXED MOBILE	35–35.19 FIXED MOBILE	35–35.19	35–35.19 FIXED LAND MOBILE NG124	PRIVATE LAND MOBILE (90)	
35.19–35.69 FIXED MOBILE	35.19–35.69 FIXED MOBILE	35.19–35.69 FIXED MOBILE	35.19–35.69	35.19–35.69 FIXED LAND MOBILE NG124	PUBLIC MOBILE (22) PRIVATE LAND MOBILE (90)	
35.69–36 FIXED MOBILE	35.69–36 FIXED MOBILE	35.69–36 FIXED MOBILE	35.69–36	35.69–36 FIXED LAND MOBILE NG124	PRIVATE LAND MOBILE (90)	
36–37 FIXED MOBILE	36–37 FIXED MOBILE	36–37 FIXED MOBILE	36–37 FIXED MOBILE US220	36–37 US220		
37–37.5 FIXED MOBILE	37–37.5 FIXED MOBILE	37–37.5 FIXED MOBILE	37–37.5	37–37.5 LAND MOBILE NG124	PRIVATE LAND MOBILE (90)	
37.5–38.25	FIXED MOBILE Radio Astronomy 547		37.5–38.0 Radio Astronomy 547	37.5–38.0 LAND MOBILE Radio Astronomy 547 NG59 NG124	PRIVATE LAND MOBILE (90)	
			38.0–38.25 FIXED MOBILE RADIO ASTRONOMY 547 US81	38.0–38.25 RADIO ASTRONOMY 547 US81		

International table			United States table		FCC use designators	
Region 1—allocation MHz	Region 2—allocation MHz	Region 3—allocation MHz	Government Allocation MHz	Non-Government Allocation MHz	Rule part(s)	Special-use frequencies
(1)	(2)	(3)	(4)	(5)	(6)	(7)
38.25–39 FIXED MOBILE	38.25–39 FIXED MOBILE	38.25–39 FIXED MOBILE	38.25–39 FIXED MOBILE	38.25–39		
39–39.986 FIXED MOBILE	39–39.986 FIXED MOBILE	39–39.986 FIXED MOBILE	39–39.986	39–39.986 LAND MOBILE NG124	PRIVATE LAND MOBILE (90)	
39.986–40 FIXED MOBILE Space Research	39.986–40 FIXED MOBILE Space Research	39.986–40 FIXED MOBILE Space Research	39.986–40	39.986–40 LAND MOBILE NG124	PRIVATE LAND MOBILE (90)	
40–40.02 FIXED MOBILE Space Research	40–40.02 FIXED MOBILE Space Research	40–40.02 FIXED MOBILE Space Research	40–40.02 FIXED MOBILE	40–40.02		
40.02–40.98 FIXED MOBILE 548	40.02–40.98 FIXED MOBILE 548	40.02–40.98 FIXED MOBILE 548	40.02–40.98 FIXED MOBILE 548 US210	40.02–40.98 548 US210		40.68±.02 MHz: Industrial, scientific and medical frequencies.
40.98–41.015 FIXED MOBILE Space Research 549	40.98–41.015 FIXED MOBILE Space Research	40.98–41.015 FIXED MOBILE Space Research 550	40.98–41.015 FIXED MOBILE	40.98–41.015		
41.015–42 FIXED MOBILE 549	41.015–42 FIXED MOBILE	41.015–42 FIXED MOBILE 550	41.015–42 FIXED MOBILE US220	41.015–42 US220		

42–43.19 FIXED MOBILE 549	42–43.19 FIXED MOBILE	42–43.19 FIXED MOBILE 550	42–43.19	42–43.19 FIXED LAND MOBILE NG124 NG141	PRIVATE LAND MOBILE (90)	
43.19–43.69 FIXED MOBILE 549	43.19–43.69 FIXED MOBILE	43.19–43.69 FIXED MOBILE 550	43.19–43.69	43.19–43.69 FIXED LAND MOBILE	PUBLIC MOBILE (22) PRIVATE LAND MOBILE (90)	
43.69–44 FIXED MOBILE 549	43.69–44 FIXED MOBILE	43.69–44 FIXED MOBILE 550	43.69–44	43.69–44 LAND MOBILE NG141	PRIVATE LAND MOBILE (90)	
44–46.6 FIXED MOBILE	44–46.6 FIXED MOBILE	44–46.6 FIXED MOBILE 552	44–46.6	LAND MOBILE NG124 NG141	PRIVATE LAND MOBILE (90)	
46.6–47 FIXED MOBILE	46.6–47 FIXED MOBILE	46.6–47 FIXED MOBILE 552	46.6–47 FIXED MOBILE	46.6–47		
47.0–68.0 BROADCASTING	47.0–50.0 FIXED MOBILE	47.0–50.0 FIXED MOBILE BROADCASTING	47.0–49.6	47.0–49.6 LAND MOBILE NG124	PRIVATE LAND MOBILE (90)	
			49.6–50.0 FIXED MOBILE	49.6–50.0		
	50.0–54.0 AMATEUR 556 557 558 560		50.0–54.0	50.0–54.0 AMATEUR	AMATEUR (97)	
553 554 555 559 561	54.0–68.0 BROADCASTING Fixed Mobile 562	54.0–68.0 FIXED MOBILE BROADCASTING	54.0–72.0	54.0–72.0 BROADCASTING	RADIO BROADCAST (TT) (73) Auxiliary Broadcasting (74)	
68.0–74.8 FIXED, MOBILE except aeronautical mobile	68.0–72.0 BROADCASTING Fixed Mobile	68.0–74.8 FIXED MOBILE				

International table			United States table		FCC use designators	
Region 1—allocation MHz	Region 2—allocation MHz	Region 3—allocation MHz	Government Allocation MHz	Non-Government Allocation MHz	Rule part(s)	Special-use frequencies
(1)	(2)	(3)	(4)	(5)	(6)	(7)
	563			NG128 NG 149		
	72.0–73.0 FIXED MOBILE		72.0–73.0	72.0–73.0 FIXED MOBILE NG3 NG49 NG56	DOMESTIC PUBLIC LAND MOBILE (22) PERSONAL (95) PRIVATE LAND MOBILE (90)	
	73.0–74.6 RADIO ASTRONOMY 570		73.0–74.6 RADIO ASTRONOMY US74	73.0–74.6 RADIO ASTRONOMY US74		
564 565 567 568 571 572	74.6–74.8 FIXED MOBILE 572	566 568 551 572	74.6–74.8 FIXED MOBILE 572 US273	74.6–74.8 FIXED MOBILE 572 US273	PRIVATE LAND MOBILE (90)	
74.8–75.2	AERONAUTICAL RADIO-NAVIGATION 572 572A		74.8–75.2 AERONAUTICAL RADIO-NAVIGATION 572	74.8–75.2 AERONAUTICAL RADIO-NAVIGATION 572	AVIATION (87)	75 MHZ Marker beacon
75.2–87.5 FIXED MOBILE except aeronautical mobile	75.2–75.4 FIXED MOBILE 571 572		75.2–75.4 FIXED MOBILE 572 US273	75.2–75.4 FIXED MOBILE 572 US273	PRIVATE LAND MOBILE (90)	
	75.4–76 FIXED MOBILE	75.4–87 FIXED MOBILE	75.4–76	75.4–76 FIXED MOBILE NG3 NG49 NG56	DOMESTIC PUBLIC LAND MOBILE (22) PERSONAL (95) PRIVATE LAND MOBILE (90)	

565 571 572 575 578	76.0–88.0 BROADCASTING Fixed Mobile	573 574 577 579	76.0–88.0	76.0–88.0 BROADCASTING	RADIO BROADCAST (TV) (73) Auxiliary Broadcasting (74)	
87.5–100 BROADCASTING	576	87–100 FIXED MOBILE BROADCASTING	NG128	NG129 NG149		
581 582	88–100 BROADCASTING	580	88–108	88–108 BROADCASTING	RADIO BROADCAST (FM) (73) Auxiliary Broadcasting (74)	
100–108	BROADCASTING 582 584 585 586 587 588 589		US93	US93 NG2 NG128 NG129		
108–117.975	AERONAUTICAL RADIO-NAVIGATION 590A		108–117.975 AERONAUTICAL RADIO-NAVIGATION US93	108–117.975 AERONAUTICAL RADIO-NAVIGATION US93		
117.975–136.0	AERONAUTICAL MOBILE (R)		117.975–121.9375 AERONAUTICAL MOBILE (R) 501 591 592 593 US26 US28	117.975–121.9375 AERONAUTICAL MOBILE (R) 501 591 592 593 US26 US28	AVIATION (87)	
			121.9375–123.0875 591 US30 US31 US33 US80 US102 US213	121.9375–123.0875 AERONAUTICAL MOBILE 591 US30 US31 US33 US80 US102 US213	AVIATION (87)	

International table			United States table		FCC use designators	
Region 1—allocation MHz	Region 2—allocation MHz	Region 3—allocation MHz	Government Allocation MHz	Non-Government Allocation MHz	Rule part(s)	Special-use frequencies
(1)	(2)	(3)	(4)	(5)	(6)	(7)
			123.0875–123.5875 AERONAUTICAL MOBILE 591 593 US32 US33 US112	123.0875–123.5875 AERONAUTICAL MOBILE 591 593 US32 US33 US112	AVIATION (87)	123.1 MHz for SAR Scene-of-Action Commu-nication
			123.5875–128.8125 AERONAUTICAL MOBILE (R) 591 US26	123.5875–128.8125 AERONAUTICAL MOBILE (R) 591 US26	AVIATION (87)	
			128.8125–132.0125 591	128.8125–132.0125 AERONAUTICAL MOBILE (R) 591	AVIATION (87)	
	501 591 592 593 594		132.0125–136.0 AERONAUTICAL MOBILE (R) 591 US26	132.0125–136.0 AERONAUTICAL MOBILE (R) 591 US26	AVIATION (87)	
136–137	AERONAUTICAL MOBILE (R) FIXED Mobile except aeronautical mobile (R) 591 595 594A		136.0–137.0 591 US244	136.0–137.0 AERONAUTICAL MOBILE (R) 591 US244	AVIATION (87) SATELLITE COMMU-NICATIONS (25)	

137.0–137.025 SPACE OPERATION (space-to-Earth) METEOROLOGICAL-SATELLITE (space-to-Earth) SPACE RESEARCH (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 599B Fixed Mobile except aeronautical mobile (R) 596 597 598 599 599A	137.0–137.025 SPACE OPERATION (space-to-Earth) METEOROLOGICAL-SATELLITE (space-to-Earth) SPACE RESEARCH (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 599B Fixed Mobile except aeronautical mobile (R) 596 597 598 599 599A	137.0–137.025 SPACE OPERATION (space-to-Earth) METEOROLOGICAL-SATELLITE (space-to-Earth) SPACE RESEARCH (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 599B Fixed Mobile except aeronautical mobile (R) 596 597 598 599 599A	137.0–137.025 SPACE OPERATION (space-to-Earth) METEOROLOGICAL-SATELLITE (space-to-Earth) SPACE RESEARCH (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 599B US318 US319 US320 599A	137.0–137.025 SPACE OPERATION (space-to-Earth) METEOROLOGICAL-SATELLITE (space-to-Earth) SPACE RESEARCH (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 599B US318 US319 US320 599A	SATELLITE COMMUNICATIONS (25)	
137.025–137.175 SPACE OPERATION (space-to-Earth) METEOROLOGICAL-SATELLITE (space-to-Earth) SPACE RESEARCH (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 599B Fixed Mobile except aeronautical mobile (R) 596 597 598 599 599A	137.025–137.175 SPACE OPERATION (space-to-Earth) METEOROLOGICAL-SATELLITE (space-to-Earth) SPACE RESEARCH (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 599B Fixed Mobile except aeronautical mobile (R) 596 597 598 599 599A	137.025–137.175 SPACE OPERATION (space-to-Earth) METEOROLOGICAL-SATELLITE (space-to-Earth) SPACE RESEARCH (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 599B Fixed Mobile except aeronautical mobile (R) 596 597 598 599 599A	137.025–137.175 SPACE OPERATION (space-to-Earth) METEOROLOGICAL-SATELLITE (space-to-Earth) SPACE RESEARCH (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 599B US318 US319 US320 599A	137.025–137.175 SPACE OPERATION (space-to-Earth) METEOROLOGICAL-SATELLITE (space-to-Earth) SPACE RESEARCH (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 599B US318 US319 US320 599A	SATELLITE COMMUNICATIONS (25)	
137.175–137.825 SPACE OPERATION (space-to-Earth) METEOROLOGICAL-SATELLITE (space-to-Earth) SPACE RESEARCH (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 599B Fixed Mobile except aeronautical mobile (R) 596 597 598 599 599A	137.175–137.825 SPACE OPERATION (space-to-Earth) METEOROLOGICAL-SATELLITE (space-to-Earth) SPACE RESEARCH (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 599B Fixed Mobile except aeronautical mobile (R) 596 597 598 599 599A	137.175–137.825 SPACE OPERATION (space-to-Earth) METEOROLOGICAL-SATELLITE (space-to-Earth) SPACE RESEARCH (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 599B Fixed Mobile except aeronautical mobile (R) 596 597 598 599 599A	137.175–137.825 SPACE OPERATION (space-to-Earth) METEOROLOGICAL-SATELLITE (space-to-Earth) SPACE RESEARCH (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 599B US318 US319 US320 599A	137.175–137.825 SPACE OPERATION (space-to-Earth) METEOROLOGICAL-SATELLITE (space-to-Earth) SPACE RESEARCH (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 599B US318 US319 US320 599A	SATELLITE COMMUNICATIONS (25)	

International table			United States table		FCC use designators	
Region 1—allocation MHz	Region 2—allocation MHz	Region 3—allocation MHz	Government Allocation MHz	Non-Government Allocation MHz	Rule part(s)	Special-use frequencies
(1)	(2)	(3)	(4)	(5)	(6)	(7)
137.825–138.0 SPACE OPERATION (space-to-Earth) METEOROLOGICAL-SATELLITE (space-to-Earth) SPACE RESEARCH (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 599B Fixed Mobile except aeronautical mobile (R) 596 597 598 599 599A	137.825–138.0 SPACE OPERATION (space-to-Earth) METEOROLOGICAL-SATELLITE (space-to-Earth) SPACE RESEARCH (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 599B Fixed Mobile except aeronautical mobile (R) 596 597 598 599 599A	137.825–138.0 SPACE OPERATION (space-to-Earth) METEOROLOGICAL-SATELLITE (space-to-Earth) SPACE RESEARCH (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 599B Fixed Mobile except aeronautical mobile (R) 596 597 598 599 599A	137.825–138.0 SPACE OPERATION (space-to-Earth) METEOROLOGICAL-SATELLITE (space-to-Earth) SPACE RESEARCH (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 599B US318 US319 US320 599A	137.825–138.0 SPACE OPERATION (space-to-Earth) METEOROLOGICAL-SATELLITE (space-to-Earth) SPACE RESEARCH (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 599B US318 US319 US320 599A	SATELLITE COMMUNICATIONS (25)	
138.0–143.6 AERONAUTICAL MOBILE (OR) 600 601 602 604	138.0–143.6 FIXED MOBILE /RADIOLOCATION/ Space Research (space-to-Earth)	138.0–143.6 FIXED MOBILE Space Research (space-to-Earth) 599 603	138.0–144.0 FIXED MOBILE US10 G30	138.0–144.0 US10		
143.6–143.65 AERONAUTICAL MOBILE (OR) SPACE RESEARCH (space-to-Earth) 601 602 604	143.6–143.65 FIXED MOBILE SPACE RESEARCH (space-to-Earth) /RADIOLOCATION/	143.6–143.65 FIXED MOBILE SPACE RESEARCH (space-to-Earth) 599 603				
143.65–144.0 AERONAUTICAL MOBILE (OR) 600 601 602 604	143.65–144.0 FIXED MOBILE /RADIOLOCATION/ Space Research (space-to-Earth)	143.65–144.0 FIXED MOBILE Space Research (space-to-Earth) 599 603				
144.0–146.0	AMATEUR 510 AMATEUR-SATELLITE		144.0–146.0	144.0–146.0 AMATEUR 510 AMATEUR-SATELLITE	AMATEUR (97)	

	605 606		510			
146.0–148 FIXED MOBILE except aeronautical Mobile (R) 608	146.0–148 AMATEUR	146.0–148 AMATEUR FIXED MOBILE 607	146.0–148	146.0–148 AMATEUR	AMATEUR (97)	
148–149.9 FIXED MOBILE except aeronautical mobile (R) MOBILE-SATELLITE (Earth-to-space) 599B 608 608A 608C	148–149.9 FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) 599B 608 608A 608C	148–149.9 FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) 599B 608 608A 608C	148–149.9 FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) 599B US319 US320 US323 US325 608 608A US10 G30	148–149.9 MOBILE-SATELLITE (Earth-to-space) 599B US319 US320 US323 US325 608 608A US10	SATELLITE COMMUNICATION (25)	
149.9–150.05 RADIONAVIGATION-SATELLITE LAND MOBILE-SATELLITE (Earth-to-space) 599 609B 608B 609 609A	149.9–150.05 RADIONAVIGATION-SATELLITE LAND MOBILE-SATELLITE (Earth-to-space) 599 609B 608B 609 609A	149.9–150.05 RADIONAVIGATION-SATELLITE LAND MOBILE-SATELLITE (Earth-to-space) 599 609B 608B 609 609A	149.9–150.05 RADIONAVIGATION-SATELLITE LAND MOBILE-SATELLITE (Earth-to-space) 599B US319 US322 608B 609A	149.9–150.05 RADIONAVIGATION-SATELLITE LAND MOBILE-SATELLITE (Earth-to-space) 599B US319 US322 608B 609A		
150.05–150.8 FIXED MOBILE except aeronautical mobile RADIO ASTRONOMY 610	150.05–150.8 FIXED MOBILE	150.05–150.8 FIXED MOBILE 611	150.05–150.8 FIXED MOBILE US216 G30	150.05–150.8 US216		
150.8–152 FIXED MOBILE except aeronautical mobile RADIO ASTRONOMY 610	150.8–152 FIXED MOBILE	150.8–152 FIXED MOBILE 611	150.8–152	150.8–152 FIXED LAND MOBILE NG51 NG112 NG124	PRIVATE LAND MOBILE (90)	
152–152.255 FIXED MOBILE except aeronautical mobile RADIO ASTRONOMY 610	152–152.255 FIXED MOBILE	152–152.255 FIXED MOBILE 611	152–152.255 US216	152–152.255 FIXED LAND MOBILE US216	PUBLIC MOBILE (22)	

International table			United States table		FCC use designators	
Region 1—allocation MHz	Region 2—allocation MHz	Region 3—allocation MHz	Government Allocation MHz	Non-Government Allocation MHz	Rule part(s)	Special-use frequencies
(1)	(2)	(3)	(4)	(5)	(6)	(7)
152.255–152.495 FIXED MOBILE except aeronautical mobile RADIO ASTRONOMY 610	152.255–152.495 FIXED MOBILE	152.255–152.495 FIXED MOBILE 611	152.255–152.495	152.255–152.495 FIXED LAND MOBILE NG124	PRIVATE LAND MOBILE (90)	
152.495–152.855 FIXED MOBILE except aeronautical mobile RADIO ASTRONOMY 610	152.495–152.855 FIXED MOBILE	152.495–152.855 FIXED MOBILE 611	152.495–152.855	152.495–152.855 FIXED LAND MOBILE NG4	PUBLIC MOBILE (22)	
152.855–153 FIXED MOBILE except aeronautical mobile RADIO ASTRONOMY 610	152.855–153 FIXED MOBILE	152.855–153 FIXED MOBILE 611	152.855–153	152.855–153 LAND MOBILE NG4 NG124	PRIVATE LAND MOBILE (90) AUXILIARY BROADCASTING (74)	
153–154 FIXED MOBILE except aeronautical mobile (R) Meteorological Aids	153–154 FIXED MOBILE	153–154 FIXED MOBILE	153–154	153–154 LAND MOBILE NG4 NG124	PRIVATE LAND MOBILE (90) AUXILIARY BROADCASTING (74)	
154–156.2475 FIXED MOBILE except aeronautical mobile (R) 613	154–156.2475 FIXED MOBILE 613	154–156.2475 FIXED MOBILE 613	154–156.2475 613 NG124 NG148	154–156.2475 FIXED LAND MOBILE 613 NG112 NG117	PRIVATE LAND MOBILE (90) MARITIME (80)	
156.2475–156.7625 FIXED MOBILE except aeronautical mobile (R) 613 613A	156.2475–156.7625 FIXED MOBILE 613 613A	156.2475–156.7625 FIXED MOBILE 613 613A	156.2475–156.7625 613 613A US77 US106 US266	156.2475–156.7625 MARITIME MOBILE 613 613A US77 US106 US266 NG117		

156.7625–156.8375 MARITIME MOBILE (distress and calling) 501 613	156.7625–156.8375 MARITIME MOBILE (distress and calling) 501 613	156.7625–156.8375 MARITIME MOBILE (distress and calling) 501 613	156.7625–156.8375 613 US107 US266	156.7625–156.8375 MARITIME MOBILE 613 US107 US266 NG117		
156.8375–157.0375 FIXED MOBILE except aeronautical mobile 613	156.8375–157.0375 FIXED MOBILE 613	156.8375–157.0375 FIXED MOBILE 613	156.8375–157.0375 613 US77 US266	156.8375–157.0375 MARITIME MOBILE 613 US77 US 266 NG117		
157.0375–157.1875 FIXED MOBILE except aeronautical mobile 613	157.0375–157.1875 FIXED MOBILE 613	157.0375–157.1875 FIXED MOBILE 613	157.0375–157.1875 MARITIME MOBILE 613 US214 US266 G109	157.0375–157.1875 613 US214 US266	Private Land Mobile (90)	
157.1875–157.45 FIXED MOBILE except aeronautical mobile 613	157.1875–157.45 FIXED MOBILE 613	157.1875–157.45 FIXED MOBILE 613	157.1875–157.45 613 US223 US266	157.1875–157.45 LAND MOBILE MARITIME MOBILE 613 US223 US266 NG111 NG154	PRIVATE LAND MOBILE (90) MARITIME (80)	
157.45–157.755 FIXED MOBILE except aeronautical mobile	157.45–157.755 FIXED MOBILE	157.45–157.755 FIXED MOBILE	157.45–157.755 US266	157.45–157.755 FIXED LAND MOBILE US266 NG111 NG 124	PRIVATE LAND MOBILE (90)	
157.755–158.115 FIXED MOBILE except aeronautical mobile	157.755–158.115 FIXED MOBILE	157.755–158.115 FIXED MOBILE	157.755–158.115	157.755–158.115 FIXED LAND MOBILE	PUBLIC MOBILE (22)	
158.115–161.575 FIXED MOBILE except aeronautical mobile 613 613B	158.115–161.575 FIXED MOBILE 613	158.115–161.575 FIXED MOBILE 613	158.115–161.575 613	158.115–161.575 FIXED LAND MOBILE 613 NG6 NG28 NG70 NG112 NG124 NG148	PUBLIC MOBILE (22) PRIVATE LAND MOBILE (90) MARITIME (80)	
161.575–161.625 FIXED MOBILE except aeronautical mobile 613	161.575–161.625 FIXED MOBILE 613	161.575–161.625 FIXED MOBILE 613	161.575–161.625 613 US77	161.575–161.625 MARITIME MOBILE 613 US77 NG6 NG17	MARITIME (80) PUBLIC MOBILE (22)	

International table			United States table		FCC use designators	
Region 1—allocation MHz	Region 2—allocation MHz	Region 3—allocation MHz	Government Allocation MHz	Non-Government Allocation MHz	Rule part(s)	Special-use frequencies
(1)	(2)	(3)	(4)	(5)	(6)	(7)
161.625–161.775 FIXED MOBILE except aeronautical mobile 613	161.625–161.775 FIXED MOBILE 613	161.625–161.775 FIXED MOBILE 613	161.625–161.775 613	161.625–161.775 LAND MOBILE 613 NG6	AUXILIARY BROADCASTING (74) PUBLIC MOBILE (22)	
161.775–162.0125 FIXED MOBILE except aeronautical mobile 613 615	161.775–162.0125 FIXED MOBILE 613	161.775–162.0125 FIXED MOBILE 613	161.775–162.0125 613 US266	161.775–162.0125 LAND MOBILE MARITIME MOBILE 613 US266 NG6 NG154	PRIVATE LAND MOBILE (90) PUBLIC MOBILE (22) MARITIME (80)	
162.0125–173.2 FIXED MOBILE except aeronautical mobile 613 615	162.0125–173.2 FIXED MOBILE 613	162.0125–173.2 FIXED MOBILE 613 616 617 618	162.0125–173.2 FIXED MOBILE 613 US8 US11 US13 US216 US223 US300 US312 G5	162.0125–173.2 613 US8 US11 US13 US216 US223 US300 US312	Auxiliary Broadcasting (74) Private Land Mobile (90)	
173.2–173.4 FIXED MOBILE except aeronautical mobile 615	173.2–173.4 FIXED MOBILE	173.2–173.4 FIXED MOBILE 617 618	173.2–173.4	173.2–173.4 FIXED Land Mobile NG124	PRIVATE LAND MOBILE (90)	
173.4–174 FIXED MOBILE except aeronautical mobile 615	173.4–174 FIXED MOBILE	173.4–174 FIXED MOBILE 617 618	173.4–174 FIXED MOBILE G5	173.4–174		
174–216 BROADCASTING 621 623 628 629	174–216 BROADCASTING Fixed Mobile 620	174–216 FIXED MOBILE BROADCASTING 619 624 625 626 630	174–216	174–216 BROADCASTING NG115 NG128 NG149	RADIO BROADCAST (TV) (73) Auxiliary Broadcasting (74)	

216–220 BROADCASTING 621 623 628 629	216–220 FIXED MARITIME MOBILE Radiolocation 627 627A	216–220 FIXED MOBILE BROADCASTING 619 624 625 626 630	216–220 MARITIME MOBILE Aeronautical Mobile Fixed Land Mobile Radiolocation 627 US210 US229 US274 US317 G2	216–220 MARITIME MOBILE Aeronautical Mobile Fixed Land Mobile 627 US210 US229 US274 US317 NG152	MARITIME (80) Private Land Mobile (90) Personal Radio Service (95) Amateur (97)	
220–222 BROADCASTING 621 623 628 629	220–222 AMATEUR FIXED MOBILE Radiolocation 627	220–222 FIXED MOBILE BROADCASTING 626	220–222 FIXED LAND MOBILE Radiolocation 627 G2	220–222 FIXED LAND MOBILE 627	PRIVATE LAND MOBILE (90)	
222–223 BROADCASTING 621 623 628 629	222–223 AMATEUR FIXED MOBILE Radiolocation 627	222–223 FIXED MOBILE BROADCASTING 619 624 625 626 630	222–223 Radiolocation 627 G2	222–223 AMATEUR 627	AMATEUR (97)	
223–225 BROADCASTING Fixed Mobile 622 628 629 631 632 635	223–225 AMATEUR FIXED MOBILE Radiolocation 627	223–225 FIXED MOBILE BROADCASTING AERONAUTICAL RADIO-NAVIGATION Radiolocation 636 637	223–225 Radiolocation 627 G2	223–225 AMATEUR 627	AMATEUR (97)	
225–230 BROADCASTING Fixed Mobile 622 628 629 631 632 635	225–230 FIXED MOBILE	225–230 FIXED MOBILE BROADCASTING AERONAUTICAL RADIO-NAVIGATION Radiolocation 636 637	225–230 FIXED MOBILE G27	225–230		
230–235 FIXED MOBILE 629 632 635 638 639	230–235 FIXED MOBILE	230–235 FIXED MOBILE AERONAUTICAL RADIO-NAVIGATION 637	230–235 FIXED MOBILE G27	230–235		
235–267 FIXED	235–267 FIXED	235–267 FIXED	235–267 FIXED	235–267		

International table			United States table		FCC use designators	
Region 1—allocation MHz	Region 2—allocation MHz	Region 3—allocation MHz	Government Allocation MHz	Non-Government Allocation MHz	Rule part(s)	Special-use frequencies
(1)	(2)	(3)	(4)	(5)	(6)	(7)
MOBILE 501 592 635 640 641 642	MOBILE 501 592 635 640 641 642	MOBILE 501 592 635 640 641 642	MOBILE 501 592 642 G27 G100	501 592 642		
267–272 FIXED MOBILE Space Operation (space-to-Earth) 641 643	267–272 FIXED MOBILE Space Operation (space-to-Earth) 641 643	267–272 FIXED MOBILE Space Operation (space-to-Earth) 641 643	267–272 FIXED MOBILE G27 G100	267–272		
272–273 SPACE OPERATION (space-to-Earth) FIXED MOBILE 641	272–273 SPACE OPERATION (space-to-Earth) FIXED MOBILE 641	272–273 SPACE OPERATION (space-to-Earth) FIXED MOBILE 641	272–273 FIXED MOBILE G27 G100	272–273		
273–312 FIXED MOBILE 641	273–312 FIXED MOBILE 641	273–312 FIXED MOBILE 641	273–312 FIXED MOBILE G27 G100	273–312		
312–315 FIXED MOBILE Mobile-Satellite (Earth-to-space) 641 641A	312–315 FIXED MOBILE Mobile-Satellite (Earth-to-space) 641 641A	312–315 FIXED MOBILE Mobile-Satellite (Earth-to-space) 641 641A	312–315 FIXED MOBILE G27 G1	312–315		
315–322 FIXED MOBILE 641	315–322 FIXED MOBILE 641	315–322 FIXED MOBILE 641	315–322 FIXED MOBILE G27 G100	315–322		
322–328.6 FIXED MOBILE RADIO ASTRONOMY 644	322–328.6 FIXED MOBILE RADIO ASTRONOMY 644	322–328.6 FIXED MOBILE RADIO ASTRONOMY 644	322–328.6 FIXED MOBILE 644 G27	322–328.6 644		
328.6–335.4	AERONAUTICAL RADIO-NAVIGATION		328.6–335.4 AERONAUTICAL RADIO-NAVIGATION	328.6–335.4 AERONAUTICAL RADIO-NAVIGATION		

	645 645A		645	645		
335.4–399.9	FIXED MOBILE 641		335.4–399.9 FIXED MOBILE G27 G100	335.4–399.9		
399.9–400.05 RADIONAVIGATION-SATELLITE 609 645B	399.9–400.05 RADIONAVIGATION-SATELLITE 609 645B	399.9–400.05 RADIONAVIGATION-SATELLITE 609 645B	399.9–400.05 RADIONAVIGATION-SATELLITE MOBILE-SATELLITE (Earth-to-space) US319 US326 645B	399.9–400.05 RADIONAVIGATION-SATELLITE MOBILE-SATELLITE (Earth-to-space) US319 US326 645B		
400.05–400.15	STANDARD FREQUENCY AND TIME SIGNAL-SATELLITE (400.1 MHz) 646 647		400.05–400.15 STANDARD FREQUENCY AND TIME SIGNAL-SATELLITE 646	400.05–400.15 STANDARD FREQUENCY AND TIME SIGNAL-SATELLITE 646		400.1 MHz: Standard frequency
400.15–401 METEOROLOGICAL AIDS METEOROLOGICAL-SATELLITE (space-to-Earth) SPACE RESEARCH (space-to-Earth) 647A MOBILE-SATELLITE (space-to-Earth) 599B Space Operation (space-to-Earth) 647 647B	400.15–401 METEOROLOGICAL AIDS METEOROLOGICAL-SATELLITE (space-to-Earth) SPACE RESEARCH (space-to-Earth) 647A MOBILE-SATELLITE (space-to-Earth) 599B Space Operation (space-to-Earth) 647 647B	400.15–401 METEOROLOGICAL AIDS METEOROLOGICAL-SATELLITE (space-to-Earth) SPACE RESEARCH (space-to-Earth) 647A MOBILE-SATELLITE (space-to-Earth) 599B Space Operation (space-to-Earth) 647 647B	400.15–401 METEOROLOGICAL AIDS (radiosonde) METEOROLOGICAL-SATELLITE (space-to-Earth) SPACE RESEARCH (space-to-Earth) 647A MOBILE-SATELLITE (space-to-Earth) 599B US319 US320 US324 Space Operation (space-to-Earth) 647 647B US70	400.15–401 METEOROLOGICAL AIDS (radiosonde) METEOROLOGICAL-SATELLITE (space-to-Earth) SPACE RESEARCH (space-to-Earth) 647A MOBILE-SATELLITE (space-to-Earth) 599B US319 US320 US324 Space Operation (space-to-Earth) 647 647B US70	SATELLITE COMMUNICATIONS (25)	
401–402	METEOROLOGICAL AIDS SPACE OPERATION (space-to-Earth) Earth Exploration-Satellite (Earth-to-space) Fixed Meteorological-Satellite (Earth-to-space) Mobile except aeronautical mobile		401–402 METEOROLOGICAL AIDS (radiosonde) SPACE OPERATION (space-to-Earth) Earth Exploration-Satellite (Earth-to-space) Meteorological-Satellite (Earth-to-space) US70	401–402 METEOROLOGICAL AIDS (radiosonde) SPACE OPERATION (space-to-Earth) Earth Exploration-Satellite (Earth-to-space) Meteorological-Satellite (Earth-to-space) US70	SATELLITE COMMUNICATIONS (25)	

International table			United States table		FCC use designators	
			Government	Non-Government		
Region 1—allocation MHz	Region 2—allocation MHz	Region 3—allocation MHz	Allocation MHz	Allocation MHz	Rule part(s)	Special-use frequencies
(1)	(2)	(3)	(4)	(5)	(6)	(7)
402–403	METEOROLOGICAL AIDS Earth Exploration-Satellite (Earth-to-space) Fixed Meteorological-Satellite (Earth-to-space) Mobile except aeronautical mobile		402–403 METEOROLOGICAL AIDS (radiosonde) Earth Exploration-Satellite (Earth-to-space) Meteorological-Satellite (Earth-to-space) US70	402–403 METEOROLOGICAL AIDS (radiosonde) Earth Exploration-Satellite (Earth-to-space) Meteorological-Satellite (Earth-to-space) US70		
403–406	METEOROLOGICAL AIDS Fixed Mobile except aeronautical mobile 648		403–406 METEOROLOGICAL AIDS (radiosonde) US70 G6	403–406 METEOROLOGICAL AIDS (radiosonde) US70		
406.0–406.1	MOBILE-SATELLITE (Earth-to-space) 649 649A		406.0–406.1 MOBILE-SATELLITE (Earth-to-space) 649 649A	406.0–406.1 MOBILE-SATELLITE (Earth-to-space) 649 649A		
406.1–410.0	FIXED MOBILE except aeronautical mobile RADIO ASTRONOMY 648 650		406.1–410.0 FIXED MOBILE RADIO ASTRONOMY US13 US74 US117 G5 G6	406.1–410.0 RADIO ASTRONOMY US13 US74 US117		
410–420	FIXED MOBILE except aeronautical mobile		410–420 FIXED MOBILE US13 G5	410–420 US13		

420–430	FIXED MOBILE except aeronautical mobile Radiolocation 651 652 653		420–450 RADIOLOCATION 664 668 US7 US87 US217 US228 US230 G2 G8	420–450 Amateur 664 668 US7 US87 US217 US228 US230 NG135	LAND MOBILE (90) Amateur (97)	
430–440 AMATEUR RADIOLOCATION 653 654 655 656 657 658 659 661 662 663 664 665	430–440 RADIOLOCATION Amateur 653 658 659 660 660A 663 664					
440–450	FIXED MOBILE except aeronautical mobile Radiolocation 651 652 653 666 667 668					
450–451 FIXED MOBILE 653 668	450–451 FIXED MOBILE 668	450–451 FIXED MOBILE 653 668	450–451 668 US87	450–451 LAND MOBILE 668 US87	AUXILIARY BROADCASTING (74)	
451–454 FIXED MOBILE 653	451–454 FIXED MOBILE	451–454 FIXED MOBILE 653	451–454	451–454 LAND MOBILE NG112 NG124	PRIVATE LAND MOBILE (90)	
454–455 FIXED MOBILE 653	454–455 FIXED MOBILE	454–455 FIXED MOBILE 653	454–455	454–455 FIXED LAND MOBILE NG12 NG112 NG148	PUBLIC MOBILE (22) MARITIME (80)	
455–456 FIXED MOBILE 653	455–456 FIXED MOBILE MOBILE-SATELLITE (Earth-to-space)	455–456 FIXED MOBILE 653	455–456	455–456 LAND MOBILE	AUXILIARY BROADCASTING (74)	
456–459 FIXED MOBILE 653 669	456–459 FIXED MOBILE 669 670	456–459 FIXED MOBILE 653 669 670	456–459 669 670	456–459 FIXED LAND MOBILE 669 670 NG112 NG124	PRIVATE LAND MOBILE (90)	

International table			United States table		FCC use designators	
Region 1—allocation MHz	Region 2—allocation MHz	Region 3—allocation MHz	Government Allocation MHz	Non-Government Allocation MHz	Rule part(s)	Special-use frequencies
(1)	(2)	(3)	(4)	(5)	(6)	(7)
459–460 FIXED MOBILE 653	459–460 FIXED MOBILE MOBILE-SATELLITE (Earth-to-space)	459–460 FIXED MOBILE 653	459–460	459–460 FIXED LAND MOBILE NG12 NG112 NG148	PUBLIC MOBILE (22) MARITIME (80)	
460–462.5375 FIXED MOBILE Meteorological-Satellite (space-to-Earth) 671 672	460–462.5375 FIXED MOBILE Meteorological-Satellite (space-to-Earth) 671	460–462.5375 FIXED MOBILE Meteorological-Satellite (space-to-Earth) 671 672	460–462.5375 Meteorological-Satellite (space-to-Earth) 671 US201 US209	460–462.5375 FIXED LAND MOBILE 671 US201 US209 NG124	PRIVATE LAND MOBILE (90)	
462.5375–462.7375 FIXED MOBILE Meteorological-Satellite (space-to-Earth) 671 672	462.5375–462.7375 FIXED MOBILE Meteorological-Satellite (space-to-Earth) 671	462.5375–462.7375 FIXED MOBILE Meteorological-Satellite (space-to-Earth) 671 672	462.5375–462.7375 Meteorological-Satellite (space-to-Earth) 671 US201	462.5375–462.7375 LAND MOBILE 671 US201	PERSONAL (95)	
462.7375–467.5375 FIXED MOBILE Meteorological-Satellite (space-to-Earth) 669 671 672	462.7375–467.5375 FIXED MOBILE Meteorological-Satellite (space-to-Earth) 669 671	462.7375–467.5375 FIXED MOBILE Meteorological-Satellite (space-to-Earth) 669 671 672	462.7375–467.5375 Meteorological-Satellite (space-to-Earth) 669 671 US201 US209 US216	462.7375–467.5375 FIXED LAND MOBILE 669 671 US201 US209 US216 NG124	PRIVATE LAND MOBILE (90)	
467.5375–467.7375 FIXED MOBILE Meteorological-Satellite (space-to-Earth) 669 671 672	467.5375–467.7375 FIXED MOBILE Meteorological-Satellite (space-to-Earth) 669 671	467.5375–467.7375 FIXED MOBILE Meteorological-Satellite (space-to-Earth) 669 671 672	467.5375–467.7375 Meteorological-Satellite (space-to-Earth) 669 671 US201	467.5375–567.7375 LAND MOBILE 669 671 US201	PERSONAL (95)	
467.7375–470 FIXED MOBILE Meteorological-Satellite (space-to-Earth)	467.7375–470 FIXED MOBILE Meteorological-Satellite (space-to-Earth)	467.7375–470 FIXED MOBILE Meteorological-Satellite (space-to-Earth)	467.7375–470 MOBILE Meteorological-Satellite (space to Earth)	467.735–470 FIXED LAND MOBILE 670 671 US201 US216	PRIVATE LAND MOBILE (90)	

671 672	670 671	670 671 672	670 671 US201 US216	NG124		
470–512 BROADCASTING 676 677A	470–512 BROADCASTING Fixed Mobile 674 675	470–512 FIXED MOBILE BROADCASTING 673 677	470–512	470–512 BROADCASTING FIXED LAND MOBILE NG66 NG114 NG127 NG128 NG149	RADIO BROADCAST (TV)(73) PRIVATE LAND MOBILE (90) PUBLIC MOBILE (22) Auxiliary Broadcasting (74)	
512–585 BROADCASTING 676 677A 683 684	512–585 BROADCASTING 678	512–585 FIXED MOBILE BROADCASTING 677 679	512–585	512–585 BROADCASTING NG128 NG149	RADIO BROADCAST (TV) (73) Auxiliary Broadcasting (74)	
585–608 BROADCASTING 677A 683 684 685 686 686A 687	585–608 BROADCASTING 678	585–608 FIXED MOBILE BROADCASTING RADIONAVIGATION 688	585–608	585–608 BROADCASTING NG128 NG149	RADIO BROADCAST (TV) (73) Auxiliary Broadcasting (74)	
608–610 BROADCASTING 677A 684 687 689	608–610 RADIO ASTRONOMY Mobile-Satellite except aeronautical mobile-satellite (Earth-to-space)	608–610 FIXED MOBILE BROADCASTING RADIONAVIGATION 688 689 690	608–610 RADIO ASTRONOMY US74 US246	608–610 RADIO ASTRONOMY US74 US246		
610–614 BROADCASTING 677A 684 687 689	610–614 RADIO ASTRONOMY Mobile-Satellite except aeronautical mobile-satellite (Earth-to-space)	610–614 FIXED MOBILE BROADCASTING 677 688 689 690 691	610–614 RADIO ASTRONOMY US74 US246	610–614 RADIO ASTRONOMY US74 US246		
614–790 BROADCASTING 677A 684 693 694	614–790 BROADCASTING Fixed Mobile 675 692 692A 693	614–790 FIXED MOBILE BROADCASTING 677 691 693	614–790	614–790 BROADCASTING NG30 NG128 NG149	RADIO BROADCAST (TV) (73) Auxiliary Broadcasting (74)	

International table			United States table		FCC use designators	
Region 1—allocation MHz	Region 2—allocation MHz	Region 3—allocation MHz	Government Allocation MHz	Non-Government Allocation MHz	Rule part(s)	Special-use frequencies
(1)	(2)	(3)	(4)	(5)	(6)	(7)
790–806 FIXED BROADCASTING 694 695 695A 696 697	790–806 BROADCASTING Fixed Mobile 675 692 692A	790–806 FIXED MOBILE BROADCASTING 677	790–806	790–806 BROADCASTING NG30 NG43 NG128 NG149	RADIO BROADCAST (TV) (73) Auxiliary Broadcasting (74)	
806–821 FIXED BROADCASTING 694 695 695A 696 697 700B	806–821 FIXED MOBILE BROADCASTING 692A 700	806–821 FIXED MOBILE BROADCASTING 677 701	806–821	806–821 FIXED LAND MOBILE NG30 NG31 NG43 NG63	PRIVATE LAND MOBILE (90) PUBLIC MOBILE (22)	
821–824 FIXED BROADCASTING 694 1695 695A 696 697 700B	821–824 FIXED MOBILE BROADCASTING 692A 700	821–824 FIXED MOBILE BROADCASTING 677 701	821–824	821–824 LAND MOBILE NG30 NG43 NG63	PRIVATE LAND MOBILE (90)	
824–849 FIXED BROADCASTING 694 695 695A 696 697 700B 702	824–849 FIXED MOBILE BROADCASTING 692A 700	824–849 FIXED MOBILE BROADCASTING 677 701	824–849	824–849 FIXED LAND MOBILE NG30 NG43 NG63 NG151	PUBLIC MOBILE (22)	
849–851 FIXED BROADCASTING 694 695A 697 702	849–851 FIXED MOBILE BROADCASTING 692A 700 700A	849–851 FIXED MOBILE BROADCASTING 677 701	849–851	849–851 AERONAUTICAL MOBILE NG30 NG63	PUBLIC MOBILE (22)	
851–862 FIXED BROADCASTING 694 695A 697 700B 702	851–862 FIXED MOBILE BROADCASTING 692A 700	851–862 FIXED MOBILE BROADCASTING 677 701	851–862	851–862 FIXED LAND MOBILE NG30 NG31 NG63	PRIVATE LAND MOBILE (90) PUBLIC MOBILE (22)	

862–866 FIXED MOBILE except aeronautical mobile BROADCASTING 703 700B 704	862–866 FIXED MOBILE BROADCASTING 692A 700	862–866 FIXED MOBILE BROADCASTING 677 701	862–866	862–866 FIXED LAND MOBILE NG30 NG31 NG63	PRIVATE LAND MOBILE (90) PUBLIC MOBILE (22)	
866–869 FIXED MOBILE except aeronautical mobile BROADCASTING 703 700B 704	866–869 FIXED MOBILE BROADCASTING 692A 700	866–869 FIXED MOBILE BROADCASTING 677 701	866–869	866–869 LAND MOBILE NG30 NG63	PRIVATE LAND MOBILE (90)	
869–890 FIXED MOBILE except aeronautical mobile BROADCASTING 703 700B 704	869–890 FIXED MOBILE BROADCASTING 692A 700	869–890 FIXED MOBILE BROADCASTING 677 701	869–890	869–890 FIXED LAND MOBILE NG30 NG63 NG151	PUBLIC MOBILE (22)	
890–894 FIXED MOBILE except aeronautical mobile BROADCASTING 703 Radiolocation 704	890–894 FIXED MOBILE except aeronautical mobile Radiolocation 700A 704A 705	890–894 FIXED MOBILE BROADCASTING Radiolocation 706	890–894 US116 US268 G2	890–894 FIXED LAND MOBILE US116 US268 NG151	PUBLIC MOBILE (22)	
894–896 FIXED MOBILE except aeronautical mobile BROADCASTING 703 Radiolocation 704	894–896 FIXED MOBILE except aeronautical mobile Radiolocation 700A 704A 705	894–896 FIXED MOBILE BROADCASTING Radiolocation 706	894–896 US116 US268 G2	894–896 AERONAUTICAL MOBILE US116 US268	PUBLIC MOBILE (22)	
896–901 FIXED MOBILE except aeronautical mobile BROADCASTING 703 Radiolocation 704	896–901 FIXED MOBILE except aeronautical mobile Radiolocation 705	896–901 FIXED MOBILE BROADCASTING Radiolocation 706	896–901 US116 US268 G2	896–901 FIXED LAND MOBILE US116 US268	PRIVATE LAND MOBILE (90)	

International table			United States table		FCC use designators	
Region 1—allocation MHz	Region 2—allocation MHz	Region 3—allocation MHz	Government Allocation MHz	Non-Government Allocation MHz	Rule part(s)	Special-use frequencies
(1)	(2)	(3)	(4)	(5)	(6)	(7)
901–902 FIXED MOBILE except aeronautical mobile BROADCASTING 703 Radiolocation 704	901–902 FIXED MOBILE except aeronautical mobile Radiolocation 705	901–902 FIXED MOBILE BROADCASTING Radiolocation 706	901–902 US116 US268 G2	901–902 FIXED MOBILE US116 US268	PERSONAL COMMUNICATIONS (24)	
902–928 FIXED MOBILE except aeronautical mobile BROADCASTING 703 Radiolocation 704	902–928 FIXED Amateur Mobile except aeronautical mobile Radiolocation 705 707 707A	902–928 FIXED MOBILE BROADCASTING Radiolocation 706	902–928 RADIOLOCATION 707 US215 US218 US267 US275 G11 G59	902–928 707 US215 US218 US267 US275	Amateur (97) Private Land Mobile (90)	915±13 MHz: Industrial scientific and medical frequency.
928–929 FIXED MOBILE except aeronautical mobile BROADCASTING 703 Radiolocation 704	928–929 FIXED MOBILE except aeronautical mobile Radiolocation 705	928–929 FIXED MOBILE BROADCASTING Radiolocation 706	928–929 US116 US 215 US268 G2	928–929 FIXED US116 US215 US268	FIXED MICROWAVE (101) PRIVATE LAND MOBILE (90) PUBLIC MOBILE (22)	
929–930 FIXED MOBILE except aeronautical mobile BROADCASTING 703 Radiolocation 704	929–930 FIXED MOBILE except aeronautical mobile Radiolocation 705	929–930 FIXED MOBILE BROADCASTING Radiolocation 706	929–930 US116 US215 US268 G2	929–930 FIXED LAND MOBILE US116 US215 US268	PRIVATE LAND MOBILE (90)	
930–931 FIXED MOBILE except aeronautical mobile BROADCASTING 703 Radiolocation 704	930–931 FIXED MOBILE except aeronautical mobile Radiolocation 705	930–931 FIXED MOBILE BROADCASTING Radiolocation 706	930–931 US116 US215 US268 G2	930–931 FIXED MOBILE US116 US215 US268	PERSONAL COMMUNICATIONS (24)	

931–932 FIXED MOBILE except aeronautical mobile BROADCASTING 703 Radiolocation 704	931–932 FIXED MOBILE except aeronautical mobile Radiolocation 705	931–932 FIXED MOBILE BROADCASTING Radiolocation 706	931–932 US116 US215 US268 G2	931–932 FIXED LAND MOBILE US116 US215 US268	PUBLIC MOBILE (22)	
932–935 FIXED MOBILE except aeronautical mobile BROADCASTING 703 Radiolocation 704	932–935 FIXED MOBILE except aeronautical mobile Radiolocation 705	932–935 FIXED MOBILE BROADCASTING Radiolocation 706	932–935 FIXED US215 US268 G2	932–935 FIXED US215 US268	FIXED MICROWAVE (101) PUBLIC MOBILE (22)	
935–940 FIXED MOBILE except aeronautical mobile BROADCASTING 703 Radiolocation 704	935–940 FIXED MOBILE except aeronautical mobile Radiolocation 705	935–940 FIXED MOBILE BROADCASTING Radiolocation 706	935–940 US116 US215 US268 G2	935–940 FIXED LAND MOBILE US116 US215 US268	PRIVATE LAND MOBILE (90)	
940–941 FIXED MOBILE except aeronautical mobile BROADCASTING 703 Radiolocation 704	940–941 FIXED MOBILE except aeronautical mobile Radiolocation 705	940–941 FIXED MOBILE BROADCASTING Radiolocation 706	940–941 US116 US268 G2	940–941 FIXED MOBILE US116 US268	PERSONAL COMMUNICATIONS (24)	
941–942 FIXED MOBILE except aeronautical mobile BROADCASTING 703 Radiolocation 704	941–942 FIXED MOBILE except aeronautical mobile Radiolocation 705	941–942 FIXED MOBILE BROADCASTING Radiolocation 706	941–942 FIXED US268 G2	941–942 FIXED US268	FIXED MICROWAVE (101) PUBLIC MOBILE (22)	
942–944 FIXED MOBILE except aeronautical mobile BROADCASTING 703 704	942–944 FIXED MOBILE	942–944 FIXED MOBILE BROADCASTING 701	942–944 FIXED US301 US302	942–944 FIXED US301 US302	FIXED MICROWAVE (101)	

International table			United States table		FCC use designators	
Region 1—allocation MHz	Region 2—allocation MHz	Region 3—allocation MHz	Government Allocation MHz	Non-Government Allocation MHz	Rule part(s)	Special-use frequencies
(1)	(2)	(3)	(4)	(5)	(6)	(7)
944–960 FIXED MOBILE except aeronautical mobile BROADCASTING 703 704	944–960 FIXED MOBILE	944–960 FIXED MOBILE BROADCASTING 701	944–960	944–960 FIXED NG120	AUXILIARY BROADCASTING (74) FIXED MICROWAVE (101) INTERNATIONAL PUBLIC FIXED (23) PUBLIC MOBILE (22)	
960–1215	AERONAUTICAL RADIONAVIGATION 709		960–1215 AERONAUTICAL RADIONAVIGATION 709 US224	960–1215 AERONAUTICAL RADIONAVIGATION 709 US224	AVIATION (87)	
1215–1240	RADIOLOCATION RADIONAVIGATION-SATELLITE (space-to-Earth) 710 711 712 712A 713		1215–1240 RADIOLOCATION RADIONAVIGATION-SATELLITE (space-to-Earth) 713 G56	1215–1240 713		
1240–1260	RADIOLOCATION RADIONAVIGATION-SATELLITE (space-to-Earth) 710 Amateur 711 712 712A 713 714		1240–1300 RADIOLOCATION 664 713 714 G56	1240–1300 Amateur 664 713 714	Amateur (97)	
1260–1300	RADIOLOCATION Amateur 664 711 712 712A 713 714					
1300–1350	AERONAUTICAL RADIONAVIGATION 717 Radiolocation 715 716 718		1300–1350 AERONAUTICAL RADIONAVIGATION 717 Radiolocation 718 G2	1300–1350 AERONAUTICAL RADIONAVIGATION 717 718	AVIATION (87)	

1350–1400 FIXED MOBILE RADIOLOCATION 718 719 720	1350–1400 RADIOLOCATION 714 718 720		1350–1400 RADIOLOCATION Fixed Mobile 714 718 720 G2 G27 G114 US311	1350–1400 714 718 720		
1400–1427	EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 721 722		1400–1427 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 722 US74 US246	1400–1427 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 722 US74 US246		
1427–1429	SPACE OPERATION (Earth-to-space) FIXED MOBILE except aeronautical mobile 722		1427–1429 SPACE OPERATION (Earth-to-space) FIXED MOBILE except aeronautical mobile 722 G30	1427–1429 SPACE OPERATION (Earth-to-space) Fixed (telemetering) Land Mobile (telemetering and telecommand) 722	Private Land Mobile (90) Satellite Communications (25)	
1429–1525 FIXED MOBILE except aeronautical mobile 722	1429–1525 FIXED MOBILE 723 722		1429–1435 FIXED MOBILE 722 G30	1429–1435 Land Mobile (telemetering and telecommand) Fixed (telemetering) 722	Private Land Mobile (90)	
			1435–1525 MOBILE (aeronautical telemetry) 722 US78	1435–1525 MOBILE (aeronautical telemetry) 722 US78	AVIATION (87)	
1525–1530 SPACE OPERATION (space-to-Earth) FIXED MARITIME MOBILE-SATELLITE (space-to-Earth) Land Mobile-Satellite (space-to-Earth) 726B Earth Exploration-Satellite Mobile except aeronautical mobile 724 722 723B 725 726A 726D	1525–1530 SPACE OPERATION (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) Earth Exploration-Satellite Fixed Mobile 723 722 723A 726A 726D	1525–1530 SPACE OPERATION (space-to-Earth) FIXED MOBILE-SATELLITE (space-to-Earth) Earth Exploration-Satellite Mobile 723 724 722 726A 726D	1525–1530 MOBILE-SATELLITE (space-to-Earth) Mobile (aeronautical telemetry) 722 726A US78	1525–1530 MOBILE-SATELLITE (space-to-Earth) Mobile (aeronautical telemetry) 722 726A US78	SATELLITE COMMUNICATION (25) Aviation (87)	

International table			United States table		FCC use designators	
Region 1—allocation MHz	Region 2—allocation MHz	Region 3—allocation MHz	Government Allocation MHz	Non-Government Allocation MHz	Rule part(s)	Special-use frequencies
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1530–1533 SPACE OPERATION (space-to-Earth) MARITIME MOBILE-SATELLITE (space-to-Earth) LAND MOBILE-SATELLITE (space-to-Earth) Earth Exploration-Satellite Fixed Mobile except aeronautical mobile 722 723B 726A 726D	1530–1533 SPACE OPERATION (space-to-Earth) MARITIME MOBILE-SATELLITE (space-to-Earth) LAND MOBILE-SATELLITE (space-to-Earth) Earth Exploration-Satellite Fixed Mobile 723 722 726A 726C 726D	1530–1533 SPACE OPERATION (space-to-Earth) MARITIME MOBILE-SATELLITE (space-to-Earth) LAND MOBILE-SATELLITE (space-to-Earth) Earth Exploration-Satellite Fixed Mobile 723 722 726A 726C 726D	1530–1535 MARITIME MOBILE-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) Mobile (aeronautical telemetering) 722 726A US78 US315	1530–1535 MARITIME MOBILE-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) Mobile (aeronautical telemetering) 722 726A US78 US315	SATELLITE COMMUNICATION (25) Aviation (87)	
1533–1535 SPACE OPERATION (space-to-Earth) MARITIME MOBILE-SATELLITE (space-to-Earth) Earth Exploration-Satellite Fixed Mobile except aeronautical mobile Land Mobile-Satellite (space-to-Earth) 726B 722 723B 726A 726D	1533–1535 SPACE OPERATION (space-to-Earth) MARITIME MOBILE-SATELLITE (space-to-Earth) Earth Exploration-Satellite Fixed Mobile 723 Land Mobile-Satellite (space-to-Earth) 726B 722 726A 726C 726D	1533–1535 SPACE OPERATION (space-to-Earth) MARITIME MOBILE-SATELLITE (space-to-Earth) Earth Exploration-Satellite Fixed Mobile 723 Land Mobile-Satellite (space-to-Earth) 726B 722 726A 726C 726D				
1535–1544 MARITIME MOBILE-SATELLITE (space-to-Earth) Land Mobile-Satellite (space-to-Earth) 726B 722 726A 726C 726D 727	1535–1544 MARITIME MOBILE-SATELLITE (space-to-Earth) Land Mobile-Satellite (space-to-Earth) 726B 722 726A 726C 726D 727	1535–1544 MARITIME MOBILE-SATELLITE (space-to-Earth) Land Mobile-Satellite (space-to-Earth) 726B 722 726A 726C 726D 727	1535–1544 MARITIME MOBILE-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 722 726A US315	1535–1544 MARITIME MOBILE-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 722 726A US315	MARITIME (80) SATELLITE COMMUNICATIONS (25)	
1544–1545 MOBILE-SATELLITE (space-to-Earth) 722 726D 727 727A	1544–1545 MOBILE-SATELLITE (space-to-Earth) 722 726D 727 727A	1544–1545 MOBILE-SATELLITE (space-to-Earth) 722 726D 727 727A	1544–1545 MOBILE-SATELLITE (space-to-Earth) 722 727A	1544–1545 MOBILE-SATELLITE (space-to-Earth) 722 727A	MARITIME (80) SATELLITE COMMUNICATION (25)	

1545–1555 AERONAUTICAL MOBILE-SATELLITE (R) (space-to-Earth) 722 726A 726D 727 729 729A 730	1545–1555 AERONAUTICAL MOBILE-SATELLITE (R) (space-to-Earth) 722 726A 726D 727 729 729A 730	1545–1555 AERONAUTICAL MOBILE-SATELLITE (R) (space-to-Earth) 722 726A 726D 727 729 729A 730	1545–1549.5 AERONAUTICAL MOBILE-SATELLITE (R) (space-to-Earth) Mobile-satellite (space-to-Earth) 722 726A US308 US309	1545–1549.5 AERONAUTICAL MOBILE-SATELLITE (R) (space-to-Earth) Mobile-satellite (space-to-Earth) 722 726A US308 US309	AVIATION (87)	
			1549.5–1558.5 AERONAUTICAL MOBILE-SATELLITE (R) (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 722 726A US308 US309	1549.5–1558.5 AERONAUTICAL MOBILE-SATELLITE (R) (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 722 726A US308 US309	AVIATION (87)	
1555–1559 LAND MOBILE-SATELLITE (space-to-Earth) 722 726A 726D 727 730 730A 730B 730C	1555–1559 LAND MOBILE-SATELLITE (space-to-Earth) 722 726A 726D 727 730 730A 730B 730C	1555–1559 LAND MOBILE-SATELLITE (space-to-Earth) 722 726A 726D 727 730 730A 730B 730C	1558.5–1559 AERONAUTICAL MOBILE-SATELLITE (R) (space-to-Earth) 722 726A US308 US309	1558.5–1559 AERONAUTICAL MOBILE-SATELLITE (R) (space-to-Earth) 722 726A US308 US309	AVIATION (87)	
1559–1610	AERONAUTICAL RADIONAVIGATION RADIONAVIGATION-SATELLITE (space-to-Earth) 722 727 730 731 731A 731B 731C 731D		1559–1610 AERONAUTICAL RADIONAVIGATION-SATELLITE (space-to-Earth) 722 US208 US260	1559–1610 AERONAUTICAL RADIONAVIGATION-SATELLITE (space-to-Earth) 722 US208 US260	AVIATION (87)	
1610–1610.6 AERONAUTICAL RADIONAVIGATION MOBILE-SATELLITE (Earth-to-space) 722 727 730 731 731E 732 733 733A 733B 733E 733F	1610–1610.6 AERONAUTICAL RADIONAVIGATION RADIODETERMINATION-SATELLITE (Earth-to-space) MOBILE-SATELLITE (Earth-to-space) 722 731E 732 733 733A 733C 733D 733E	1610–1610.6 AERONAUTICAL RADIONAVIGATION MOBILE-SATELLITE (Earth-to-space) RADIODETERMINATION-SATELLITE (Earth-to-space) 722 727 730 731E 732 733 733A 733B 733E	1610–1610.6 AERONAUTICAL RADIONAVIGATION RADIODETERMINATION-SATELLITE (Earth-to-space) MOBILE-SATELLITE (Earth-to-space) 722 731E 732 733 733A 733E US208 US260 US319	1610–1610.6 AERONAUTICAL RADIONAVIGATION RADIODETERMINATION-SATELLITE (Earth-to-space) MOBILE-SATELLITE (Earth-to-space) 722 731E 732 733 733A 733E US208 US260 US319	AVIATION (87) SATELLITE COMMUNICATION (25)	

International table			United States table		FCC use designators	
Region 1—allocation MHz	Region 2—allocation MHz	Region 3—allocation MHz	Government Allocation MHz	Non-Government Allocation MHz	Rule part(s)	Special-use frequencies
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1610.6–1613.8 AERONAUTICAL RADIONAVIGATION MOBILE-SATELLITE (Earth-to-space) RADIO ASTRONOMY 722 727 730 731 731E 732 733 733A 733B 733E 733F 734	1610.6–1613.8 AERONAUTICAL RADIONAVIGATION RADIODETERMINATION-SATELLITE (Earth-to-space) MOBILE-SATELLITE (Earth-to-space) RADIO ASTRONOMY 722 731E 732 733 733A 733C 733D 733E 734	1610.6–1613.8 AERONAUTICAL RADIONAVIGATION MOBILE-SATELLITE (Earth-to-space) RADIO ASTRONOMY Radiodetermination-Satellite (Earth-to-space) 722 727 730 731E 732 733 733A 733B 733E 734	1610.6–1613.8 AERONAUTICAL RADIONAVIGATION RADIODETERMINATION-SATELLITE (Earth-to-space) MOBILE-SATELLITE (Earth-to-space) RADIO ASTRONOMY 722 731E 732 733 733A 733E 734 US208 US260 US319	1610.6–1613.8 AERONAUTICAL RADIONAVIGATION RADIODETERMINATION-SATELLITE (Earth-to-space) MOBILE-SATELLITE (Earth-to-space) RADIO ASTRONOMY 722 731E 732 733 733A 733E 734 US208 US260 US319	AVIATION (87) SATELLITE COMMUNICATION (25)	
1613.8–1626.5 AERONAUTICAL RADIONAVIGATION MOBILE-SATELLITE (Earth-to-space) Mobile-Satellite (space-to-Earth) 722 727 730 731 731E 731F 732 733 733A 733B 733E 733F	1613.8–1626.5 AERONAUTICAL RADIONAVIGATION RADIODETERMINATION-SATELLITE (Earth-to-space) MOBILE-SATELLITE (Earth-to-space) Mobile-Satellite (space-to-Earth) 722 731E 731F 732 733 733A 732C 733D 733E	1613.8–1626.5 AERONAUTICAL RADIONAVIGATION MOBILE-SATELLITE (Earth-to-space) Radiodetermination-Satellite (Earth-to-space) Mobile-Satellite (space-to-Earth) 722 727 730 731E 731F 732 733 733A 733B 733E	1613.8–1626.5 AERONAUTICAL RADIONAVIGATION RADIODETERMINATION-SATELLITE (Earth-to-space) MOBILE-SATELLITE (Earth-to-space) Mobile-Satellite (space-to-Earth) 722 731E 731F 732 733 733E US208 US260 US319	1613.8–1626.5 AERONAUTICAL RADIONAVIGATION RADIODETERMINATION SATELLITE (Earth-to-space) MOBILE-SATELLITE (Earth-to-space) Mobile-Satellite (space-to-Earth) 722 731E 731F 732 733 733E US208 US260 US319	AVIATION (87) SATELLITE COMMUNICATION (25)	
1626.5–1631.5 MARITIME MOBILE-SATELLITE (Earth-to-space) Land Mobile-Satellite (Earth-to-space) 726B 722 726A 726D 727 730	1625.5–1631.5 MOBILE-SATELLITE (Earth-to-space) 722 726A 726C 726D 727 730	1626.5–1631.5 MOBILE-SATELLITE (Earth-to-space) 722 726A 726C 726D 727 730	1626.5–1645.5 MARITIME MOBILE-SATELLITE (Earth-to-space) MOBILE-SATELLITE (Earth-to-space)	1626.5–1645.5 MARITIME MOBILE-SATELLITE (Earth-to-space) MOBILE-SATELLITE (Earth-to-space)	MARITIME (80) SATELLITE COMMUNICATION (25)	
1631.5–1634.5 MARITIME MOBILE-SATELLITE (Earth-to-space) LAND MOBILE-SATELLITE (Earth-to-space)	1631.5–1634.5 MARITIME MOBILE-SATELLITE (Earth-to-space) LAND MOBILE-SATELLITE (Earth-to-space)	1631.5–1634.5 MARITIME MOBILE-SATELLITE (Earth-to-space) LAND MOBILE-SATELLITE (Earth-to-space)				

722 726A 726C 726D 727 730 734A	722 726A 726C 726D 727 730 734A	722 726A 726C 726D 727 730 734A				
1634.5–1645.5 MARITIME MOBILE-SATELLITE (Earth-to-space) Land Mobile-Satellite (Earth-to-space) 726B 722 726A 726C 726D 727 730	1634.5–1645.5 MARITIME MOBILE-SATELLITE (Earth-to-space) Land Mobile-Satellite (Earth-to-space) 726B 722 726A 726C 726D 727 730	1634.5–1645.5 MARITIME MOBILE-SATELLITE (Earth-to-space) Land Mobile-Satellite (Earth-to-space) 726B 722 726A 726C 726D 727 730	722 726A US315	722 726A US315		
1645.5–1646.5 MOBILE-SATELLITE (Earth-to-space) 722 726D 734B	1645.5–1646.5 MOBILE-SATELLITE (Earth-to-space) 722 726D 734B	1645.5–1646.5 MOBILE-SATELLITE (Earth-to-space) 722 726D 734B	1645.5–1646.5 MOBILE-SATELLITE (Earth-to-space) 722 734B	1645.5–1646.5 MOBILE-SATELLITE (Earth-to-space) 722 734B	MARITIME (80) SATELLITE COMMUNICATION (25)	
1646.5–1656.5 AERONAUTICAL MOBILE-SATELLITE (R) (Earth-to-space) 722 726A 726D 727 729A 730 735	1646.5–1656.5 AERONAUTICAL MOBILE-SATELLITE (R) (Earth-to-space) 722 726A 726D 727 729A 730 735	1646.5–1656.5 AERONAUTICAL MOBILE-SATELLITE (R) (Earth-to-space) 722 726A 726D 727 729A 730 735	1646.5–1651 AERONAUTICAL MOBILE-SATELLITE (R) (Earth-to-space) Mobile-Satellite (Earth-to-space) 722 726A US308 US309	1646.5–1651 AERONAUTICAL MOBILE-SATELLITE (R) (Earth-to-space) Mobile-Satellite (Earth-to-space) 722 726A US308 US309	AVIATION (87)	
1656.5–1660 LAND MOBILE-SATELLITE (Earth-to-space) 722 726A 726D 727 730 730A 730B 730C 734A	1656.5–1660 LAND MOBILE-SATELLITE (Earth-to-space) 722 726A 726D 727 730 730A 730B 730C 734A	1656.5–1660 LAND MOBILE-SATELLITE (Earth-to-space) 722 726A 726D 727 730 730A 730B 730C 734A	1651–1660 AERONAUTICAL MOBILE-SATELLITE (R) (Earth-to-space) MOBILE-SATELLITE (Earth-to-space) 722 726A US308 US39	1651–1660 AERONAUTICAL MOBILE-SATELLITE (R) (Earth-to-space) MOBILE-SATELLITE (Earth-to-space) 722 726A US308 US39	AVIATION (87)	
1660–1660.5 RADIO ASTRONOMY LAND MOBILE-SATELLITE (Earth-to-space) 722 726A 726D 730A 730B 730C 736	1660–1660.5 RADIO ASTRONOMY LAND MOBILE-SATELLITE (Earth-to-space) 722 726A 726D 730A 730B 730C 736	1660–1660.5 RADIO ASTRONOMY LAND MOBILE-SATELLITE (Earth-to-space) 722 726A 726D 730A 730B 730C 736	1660–1660.5 AERONAUTICAL MOBILE-SATELLITE (R) (Earth-to-space) RADIO ASTRONOMY 722 726A 736 US309	1660–1660.5 AERONAUTICAL MOBILE-SATELLITE (R) (Earth-to-space) RADIO ASTRONOMY 722 726A 736 US309	AVIATION (87)	

International table			United States table		FCC use designators	
Region 1—allocation MHz	Region 2—allocation MHz	Region 3—allocation MHz	Government Allocation MHz	Non-Government Allocation MHz	Rule part(s)	Special-use frequencies
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1660.5–1668.4	RADIO ASTRONOMY SPACE RESEARCH (passive) Fixed Mobile except aeronautical mobile 722 736 737 738 739		1660.5–1668.4 RADIO ASTRONOMY SPACE RESEARCH (passive) 722 US74 US246	1660.5–1668.4 RADIO ASTRONOMY SPACE RESEARCH (passive) 722 US74 US246		
1668.4–1670.0	METEOROLOGICAL AIDS FIXED MOBILE except aeronautical mobile RADIO ASTRONOMY 722 736		1668.4–1670.0 METEOROLOGICAL AIDS (radiosonde) RADIO ASTRONOMY 722 736 US74 US99	1668.4–1670.0 METEOROLOGICAL AIDS (radiosonde) RADIO ASTRONOMY 722 736 US74 US99		
1670–1675	METEOROLOGICAL AIDS FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE 740A 722		1670–1690 METEOROLOGICAL AIDS (radiosonde) METEOROLOGICAL-SATELLITE (space-to-Earth) 722 US211	1670–1690 METEOROLOGICAL AIDS (radiosonde) METEOROLOGICAL-SATELLITE (space-to-Earth) 722 US211		
1675–1690 METEOROLOGICAL AIDS FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile 722	1675–1690 METEOROLOGICAL AIDS FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile 722 735A	1675–1690 METEOROLOGICAL AIDS FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile 722				

1690–1700 METEOROLOGICAL AIDS METEOROLOGICAL SATELLITE (space-to-Earth) FIXED MOBILE except aeronautical mobile 671 722 741	1690–1700 METEOROLOGICAL AIDS METEOROLOGICAL SATELLITE (space-to-Earth) MOBILE-SATELLITE (Earth-to-space) 671 722 735A 740	1690–1700 METEOROLOGICAL AIDS METEOROLOGICAL SATELLITE (space-to-Earth) 671 722 740 742	1690–1700 METEOROLOGICAL AIDS (Radiosonde) METEOROLOGICAL SATELLITE (space-to-Earth) 671 722	1690–1700 METEOROLOGICAL AIDS (Radiosonde) METEOROLOGICAL SATELLITE (space-to-Earth) 671 722		
1700–1710 FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile 671 722	1700–1710 FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile MOBILE-SATELLITE (Earth-to-space) 671 722 735A	1700–1710 FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile 671 722 743	1700–1710 FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) 671 722 G118	1700–1710 METEOROLOGICAL-SATELLITE (space-to-Earth) Fixed 671 722		
1710–1850 FIXED MOBILE 740A 722 744 746	1710–1850 FIXED MOBILE 740A 722 744 745	1710–1850 FIXED MOBILE 740A 722 744 745	1710–1850 FIXED MOBILE 722 US256 G42	1710–1850 722 US256		
1850–1930 FIXED MOBILE 740A 746A	1850–1930 FIXED MOBILE 740A 746A	1850–1930 FIXED MOBILE 740A 746A	1850–1930	1850–1930 FIXED MOBILE	FIXED MICROWAVE (101) PERSONAL COMMUNICATIONS (24) RADIO FREQUENCY DEVICES (15)	
1930–1970 FIXED MOBILE 746A	1930–1970 FIXED MOBILE Mobile-Satellite (Earth-to-Space) 746A	1930–1970 FIXED MOBILE 746A	1930–1970	1930–1970 FIXED MOBILE	FIXED MICROWAVE (101) PERSONAL COMMUNICATIONS (24)	
1970–1980 FIXED MOBILE 746A	1970–1980 FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) 746A 746B 746C	1970–1980 FIXED MOBILE 746A	1970–1980	1970–1980 FIXED MOBILE	FIXED MICROWAVE (101) PERSONAL COMMUNICATIONS (24)	

International table			United States table		FCC use designators	
Region 1—allocation MHz	Region 2—allocation MHz	Region 3—allocation MHz	Government Allocation MHz	Non-Government Allocation MHz	Rule part(s)	Special-use frequencies
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1980–1990 FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) 746A 746B	1980–1990 FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) 746A 746B 746C	1980–1990 FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) 746A 746B	1980–1990	1980–1990 FIXED MOBILE	FIXED MICROWAVE (101) PERSONAL COMMUNICATIONS (24)	
1990–2010 FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) 746A 746B	1990–2010 FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) 746A 746B 746C	1990–2010 FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) 746A 746B	1990–2010 US90 US111 US219 US222	1990–2010 FIXED MOBILE US90 US111 US219 US222 NG23 NG118	AUXILIARY BROADCASTING (74) CABLE TELEVISION (78)	
2010–2025 FIXED MOBILE 746A	2010–2025 FIXED MOBILE 746A	2010–2025 FIXED MOBILE 746A	2010–2025 US111 US222	2010–2025 FIXED MOBILE US111 US222 NG23 NG118	AUXILIARY BROADCASTING (74) CABLE TELEVISION (78)	
2025–2110 FIXED MOBILE 747A SPACE RESEARCH (Earth-to-space) (space-to-space) SPACE OPERATION (Earth-to-space) (space-to-space) EARTH EXPLORATION-SATELLITE (Earth-to-space) (space-to-space) 750A	2025–2110 FIXED MOBILE 747A SPACE RESEARCH (Earth-to-space) (space-to-space) SPACE OPERATION (Earth-to-space) (space-to-space) EARTH EXPLORATION-SATELLITE (Earth-to-space) (space-to-space) 750A	2025–2110 FIXED MOBILE 747A SPACE RESEARCH (Earth-to-space) (space-to-space) SPACE OPERATION (Earth-to-space) (space-to-space) EARTH EXPLORATION-SATELLITE (Earth-to-space) (space-to-space) 750A	2025–2110 US90 US111 US219 US222	2025–2110 FIXED MOBILE US90 US111 US219 US222 NG23 NG118	AUXILIARY BROADCASTING (74) CABLE TELEVISION (78)	

2110–2120	FIXED MOBILE SPACE RESEARCH (deep space) (Earth-to-space) 746A		2110–2200	2110–2150 FIXED MOBILE US111 US252 NG23 NG153	Domestic public fixed (21) Private operational-fixed microwave (94) Public mobile (22)	EMERGING TECH-NOL-OGIES
2120–2160 FIXED MOBILE 746A	2120–2160 FIXED MOBILE MOBILE-SATELLITE (space-to-Earth) 746A	2120–2160 FIXED MOBILE 746A		2150–2160 FIXED NG23	Multipoint distribution (21) Private operational-fixed microwave (94)	
2160–2170 FIXED MOBILE 746A	2160–2170 FIXED MOBILE MOBILE SATELLITE (space-to-Earth) 746A 746B 746C	2160–2170 FIXED MOBILE 746A		2160–2200 FIXED MOBILE NG23 NG153	Domestic public fixed (21) Private operational-fixed microwave (94) Public mobile (22)	EMERGING TECH-NOL-OGIES
2170–2200	FIXED MOBILE MOBILE-SATELLITE (space-to-Earth) 746A 746B 746C		US111 US252			
2200–2290	FIXED SPACE RESEARCH (space-to-Earth) (space-to-space) SPACE OPERATION (space-to-Earth) (space-to-space) EARTH EXPLORATION-SATELLITE (space-to-Earth) (space-to-space) MOBILE 747A 750A		2200–2290 FIXED MOBILE SPACE RESEARCH (space-to-Earth) (space-to-space) US303 G101	2200–2290 US303		

International table			United States table		FCC use designators	
Region 1—allocation MHz	Region 2—allocation MHz	Region 3—allocation MHz	Government Allocation MHz	Non-Government Allocation MHz	Rule part(s)	Special-use frequencies
(1)	(2)	(3)	(4)	(5)	(6)	(7)
2290–2300 FIXED SPACE RESEARCH (space-to-Earth) (deep space) MOBILE except aeronautical mobile 743A	2290–2300 FIXED MOBILE except aeronautical mobile SPACE RESEARCH (space-to-Earth) (deep space)		2290–2300 FIXED MOBILE except aeronautical mobile SPACE RESEARCH (space-to-Earth) (deep space only)	2290–2300 SPACE RESEARCH (space-to-Earth) (deep space only)		
2300–2450 FIXED MOBILE Amateur Radiolocation	2300–2450 FIXED MOBILE RADIOLOCATION Amateur	2300–2450 FIXED MOBILE RADIOLOCATION Amateur	2300–2310 RADIOLOCATION Fixed Mobile US253 G2	2300–2310 Amateur US253	Amateur (97)	
			2310–2360 Mobile Radiolocation Fixed 751B US276 US327 US328 G2 G120	2310–2360 BROADCASTING-SATELLITE Mobile 751B US276 US327 US328		Digital Audio Radio Services
			2360–2390 MOBILE RADIOLOCATION Fixed US276 G2 G120	2360–2390 MOBILE US276		
			2390–2400 G122	2390–2400 AMATEUR	Radio Frequency Devices (15) AMATEUR (97)	
			2400–2402 RADIOLOCATION 664 752 G2	2400–2402 Amateur 664 752	Amateur (97)	

			2402–2417 664 752 G122	2402–2417 AMATEUR 664 752	AMATEUR (97) Radio Frequency Devices (15)	
664 751A 752	664 750B 751 751B 752	664 750B 751 751B 752	2417–2450 RADIOLOCATION 664 752 G2	2417–2450 Amateur 664 752	Amateur (97)	
2450–2483.5 FIXED MOBILE Radiolocation 752 753	2450–2483.5 FIXED MOBILE RADIOLOCATION 752		2450–2483.5 752 US41	2450–2483.5 FIXED MOBILE Radiolocation 752 US41		2450±50 MHz: Industrial, scientific and medical frequency
2483.5–2500 FIXED MOBILE MOBILE-SATELLITE (space-to-Earth) Radiolocation 733F 752 753 753A 753B 753C 753F	2483.5–2500 FIXED MOBILE RADIODETERMINATION-SATELLITE (space-to-Earth) 753A RADIOLOCATION MOBILE-SATELLITE (space-to-Earth) 752 753D 753F	2483.5–2500 FIXED MOBILE RADIOLOCATION MOBILE-SATELLITE (space-to-Earth) Radiodetermination-Satellite (space-to-Earth) 753A 752 753C 753F	2483.5–2500 RADIODETERMINATION-SATELLITE (space-to-Earth) 753A MOBILE-SATELLITE (space-to-Earth) 752 753F US41 US319	2483.5–2500 RADIODETERMINATION-SATELLITE (space-to-Earth) 753A MOBILE-SATELLITE (space-to-Earth) 752 753F US41 US319 NG147	SATELLITE COMMUNICATION (25)	
2500–2655 FIXED 762 763 764 MOBILE except aeronautical mobile BROADCASTING-SATELLITE 757 760	2500–2655 FIXED 762 764 FIXED-SATELLITE (space-to-Earth) 761 MOBILE except aeronautical mobile BROADCASTING-SATELLITE 757 760	2500–2535 FIXED 762 764 FIXED SATELLITE (space-to-Earth) 761 MOBILE except aeronautical mobile BROADCASTING-SATELLITE 757 760 754 754A 2535–2655 FIXED 762 764 MOBILE except aeronautical mobile BROADCASTING-SATELLITE 757 760	2500–2655	2500–2655 FIXED BROADCASTING-SATELLITE	AUXILIARY BROADCASTING (74) DOMESTIC PUBLIC FIXED RADIO (21)	

International table			United States table		FCC use designators	
Region 1—allocation MHz	Region 2—allocation MHz	Region 3—allocation MHz	Government Allocation MHz	Non-Government Allocation MHz	Rule part(s)	Special-use frequencies
(1)	(2)	(3)	(4)	(5)	(6)	(7)
720 753 756 758 759	720 755	720	720 US205 US269	720 US205 US269 NG101 NG102		
2655–2690 FIXED 762 763 764 MOBILE except aeronautical mobile BROADCASTING-SATELLITE 757 760 Earth Exploration-Satellite (passive) Radio Astronomy Space Research (passive) 758 759 765	2655–2690 FIXED 762 764 FIXED-SATELLITE (Earth-to-space) (space-to-Earth) 761 MOBILE except aeronautical mobile BROADCASTING-SATELLITE 757 760 Earth Exploration-Satellite (passive) Radio Astronomy Space Research (passive) 765	2655–2690 FIXED 762 764 FIXED-SATELLITE (Earth-to-space) 761 MOBILE except aeronautical mobile BROADCASTING-SATELLITE 757 760 Earth Exploration-Satellite (passive) Radio Astronomy Space Research (passive) 765 766	2655–2690 Earth Exploration-Satellite (passive) Radio Astronomy Space Research (passive) US205 US269	2655–2690 FIXED BROADCASTING-SATELLITE Earth Exploration-Satellite (passive) Radio Astronomy Space Research (passive) US205 US269 NG47 NG101 NG102	AUXILIARY BROADCASTING (74) PRIVATE OPERATIONAL-FIXED MICROWAVE (94)	
2690–2700	EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 767 768 769		2690–2700 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) US74 US246	2690–2700 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) US74 US246		
2700–2900	AERONAUTICAL RADIONAVIGATION 717 Radiolocation 770 771		2700–2900 AERONAUTICAL RADIONAVIGATION 717 METEOROLOGICAL AIDS Radiolocation 770 US18 G2 G15	2700–2900 717 770 US18		
2900–3100	RADIONAVIGATION Radiolocation 772 773 775A		2900–3100 MARITIME RADIONAVIGATION 775A Radiolocation US44 US316 G56	2900–3100 MARITIME RADIONAVIGATION 775A Radiolocation US44 US316	MARITIME (80)	

3100–3300	RADIOLOCATION 713 777 778		3100–3300 RADIOLOCATION 713 778 US110 G59	3100–3300 Radiolocation 713 778 US110		
3300–3400 RADIOLOCATION 778 779 780	3300–3400 RADIOLOCATION Amateur Fixed Mobile 778 780	3300–3400 RADIOLOCATION Amateur 778 779	3300–3500 RADIOLOCATION 664 778 US108 G31	3300–3500 Amateur Radiolocation 664 778 US108	Amateur (97)	
3400–3600 FIXED FIXED-SATELLITE (space-to-Earth) Mobile Radiolocation 781 782 785	3400–3500 FIXED FIXED-SATELLITE (space-to-Earth) Amateur Mobile Radiolocation 784 664 783					
	3500–3700 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile Radiolocation 784		3500–3600 AERONAUTICAL RADIONAVIGATION (ground-based) RADIOLOCATION US110 G59 G110	3500–3600 Radiolocation US110		
3600–4200 FIXED FIXED-SATELLITE (space-to-Earth) Mobile	786		3600–3700 AERONAUTICAL RADIONAVIGATION (ground-based) RADIOLOCATION US110 US245 G59 G110	3600–3700 FIXED-SATELLITE (space-to-Earth) Radiolocation US110 US245		
	3700–4200 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile 787		3700–4200	3700–4200 FIXED FIXED-SATELLITE (space-to-Earth) NG41	DOMESTIC PUBLIC FIXED (21) SATELLITE COMMUNICATIONS (25) PRIVATE OPERATIONAL FIXED MICROWAVE (94)	
4200–4400	AERONAUTICAL RADIONAVIGATION 789		4200–4400 AERONAUTICAL RADIONAVIGATION	4200–4400 AERONAUTICAL RADIONAVIGATION	AVIATION (87)	

International table			United States table		FCC use designators	
Region 1—allocation MHz	Region 2—allocation MHz	Region 3—allocation MHz	Government Allocation MHz	Non-Government Allocation MHz	Rule part(s)	Special-use frequencies
(1)	(2)	(3)	(4)	(5)	(6)	(7)
	788 790 791		791 US261	791 US261		
4400–4500	FIXED MOBILE		4400–4500 FIXED MOBILE	4400–4500		
4500–4800 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE	4500–4800 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE	4500–4800 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE	4500–4660 FIXED MOBILE US245	4500–4660 FIXED-SATELLITE (space-to-Earth) 792A US245		
			4660–4685 G122	4660–4685 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE 792A US245		
792A	792A	792A	4685–4800 FIXED MOBILE US245	4685–4800 FIXED-SATELLITE (space-to-Earth) 792A US245		
4800–4990	FIXED MOBILE 793 Radio Astronomy 720 778 794		4800–4990 FIXED MOBILE 720 778 US203 US257	4800–4990 720 778 US203 US257		
4990–5000	FIXED MOBILE except aeronautical mobile RADIO ASTRONOMY Space Research (passive) 795		4990–5000 RADIO ASTRONOMY Space Research (passive) US74 US246	4990–5000 RADIO ASTRONOMY Space Research (passive) US74 US246		

5000–5250	AERONAUTICAL RADIO-NAVIGATION 733 796 797 797A 797B		5000–5250 AERONAUTICAL RADIO-NAVIGATION 733 796 797 797A US211 US260 US307	5000–5250 AERONAUTICAL RADIO-NAVIGATION 733 796 797 797A US211 US260 US307	AVIATION (87) Satellite communication (25)	
5250–5255	RADIOLOCATION Space Research 713 798		5250–5350 RADIOLOCATION 713 US110 G59	5250–5350 Radiolocation 713 US110		
5255–5350	RADIOLOCATION 713 798					
5350–5460	AERONAUTICAL RADIO-NAVIGATION 799 Radiolocation		5350–5460 AERONAUTICAL RADIO-NAVIGATION 799 RADIOLOCATION US48 G56	5350–5460 AERONAUTICAL RADIO-NAVIGATION 799 Radiolocation US48	AVIATION (87)	
5460–5470	RADIONAVIGATION 799 Radiolocation		5460–5470 RADIONAVIGATION 799 Radiolocation US49 US65 G56	5460–5470 RADIONAVIGATION 799 Radiolocation US49 US65		
5470–5650	MARITIME RADIO-NAVIGATION Radiolocation 800 801 802		5470–5600 MARITIME RADIO-NAVIGATION Radiolocation US50 US65 G56	5470–5600 MARITIME RADIO-NAVIGATION Radiolocation US50 US65	MARITIME (80)	
			5600–5650 MARITIME RADIO-NAVIGATION METEOROLOGICAL AIDS Radiolocation 772 802 US51 US65 G56	5600–5650 MARITIME RADIO-NAVIGATION METEOROLOGICAL AIDS Radiolocation 772 802 US51 US65	MARITIME (80)	
5650–5725	RADIOLOCATION Amateur Space Research (deep space)		5650–5850 RADIOLOCATION	5650–5850 Amateur	Amateur (97) Industrial, Scientific, and Medical Equipment (18)	58000±75 MHz Industrial, scientific and medical frequency

International table			United States table		FCC use designators	
Region 1—allocation MHz	Region 2—allocation MHz	Region 3—allocation MHz	Government Allocation MHz	Non-Government Allocation MHz	Rule part(s)	Special-use frequencies
(1)	(2)	(3)	(4)	(5)	(6)	(7)
	664 801 803 804 805					
5725–5850 FIXED-SATELLITE (Earth-to-space) RADIOLOCATION Amateur 801 803 805 806 807 808	5725–5850 RADIOLOCATION Amateur 803 805 806 808		664 806 808 G2	644 806 808		
5850–5925 FIXED FIXED-SATELLITE (Earth-to-space) MOBILE 806	5850–5925 FIXED FIXED-SATELLITE (Earth-to-space) MOBILE Amateur Radiolocation 806	5850–5925 FIXED FIXED-SATELLITE (Earth-to-space) MOBILE Radiolocation 806	5850–5925 RADIOLOCATION 806 US245 G2	5850–5925 FIXED-SATELLITE (Earth-to-space) Amateur 806 US245	Amateur (97)	
5925–7075	FIXED FIXED-SATELLITE (Earth-to-space) MOBILE		5925–7125	5925–6425 FIXED FIXED SATELLITE (Earth-to-space) NG41	DOMESTIC PUBLIC FIXED (21) SATELLITE COMMUNICATIONS (25) PRIVATE OPERATIONAL FIXED MICROWAVE (94)	
				6425–6525 FIXED-SATELLITE (Earth-to-space) MOBILE 791 809	AUXILIARY BROADCAST (74) CABLE TELEVISION (78) DOMESTIC PUBLIC FIXED (21) PRIVATE OPERATIONAL-FIXED MICROWAVE (94)	

	791 792A 809			6525–6875 FIXED FIXED-SATELLITE (Earth-to-space) 792A 809	DOMESTIC PUBLIC FIXED (21) SATELLITE COMMUNICATIONS (25) PRIVATE OPERATION-FIXED MICROWAVE (94)	
				6875–7075 FIXED FIXED-SATELLITE (Earth-to-space) MOBILE 792A 809 NG118	AUXILIARY BROADCAST (74) CABLE TELEVISION (78) DOMESTIC PUBLIC FIXED (21)	
7075–7250	FIXED MOBILE 809 810 811		791 809	7075–7125 FIXED MOBILE 809 NG118	AUXILIARY BROADCAST (74) CABLE TELEVISION (78) DOMESTIC PUBLIC FIXED (21)	
			7125–7190 FIXED 809 US252 G116	7125–8450		
			7190–7235 FIXED SPACE RESEARCH (Earth-to-space) 809			
			7235–7250 FIXED 809			
7250–7300	FIXED FIXED-SATELLITE (space-to-Earth) MOBILE 812		7250–7300 FIXED-SATELLITE (space-to-Earth) MOBILE–SATELLITE (space-to-Earth) Fixed G117			

International table			United States table		FCC use designators	
Region 1—allocation MHz	Region 2—allocation MHz	Region 3—allocation MHz	Government Allocation MHz	Non-Government Allocation MHz	Rule part(s)	Special-use frequencies
(1)	(2)	(3)	(4)	(5)	(6)	(7)
7300–7450	FIXED FIXED-SATELLITE (space-to-Earth) MOBILE except aeronautial mobile 812		7300–7450 FIXED FIXED-SATELLITE (space-to-Earth) Mobile-Satellite (space-to-Earth) G117			
7450–7550	FIXED FIXED-SATELLITE (space-to-Earth) METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile		7450–7550 FIXED FIXED-SATELLITE (space-to-Earth) METEOROLOGICAL-SATELLITE (space-to-Earth) Mobile-Satellite (space-to-Earth) G104 G117			
7550–7750	FIXED FIXED-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile		7550–7750 FIXED FIXED-SATELLITE (space-to-Earth) Mobile-Satellite (space-to-Earth) G117			
7750–7900	FIXED MOBILE except aeronautical mobile		7750–7900 FIXED			
7900–7975	FIXED FIXED-SATELLITE (Earth-to-space) MOBILE 812		7900–8025 FIXED-SATELLITE (Earth-to-space) MOBILE-SATELLITE (Earth-to-space) Fixed			

7975–8025	FIXED FIXED-SATELLITE (Earth-to-space) MOBILE 812		G117
8025–8175 FIXED FIXED-SATELLITE (Earth-to-space) MOBILE Earth Exploration-Satellite (space-to-Earth) 813 815	8025–8175 EARTH EXPLORATION-SATELLITE (space-to-Earth) FIXED FIXED-SATELLITE (Earth-to-space) MOBILE 814	8025–8175 FIXED FIXED-SATELLITE (Earth-to-space) MOBILE Earth Exploration-Satellite (space-to-Earth) 813 815	8025–8175 EARTH EXPLORATION-SATELLITE (space-to-Earth) FIXED FIXED-SATELLITE (Earth-to-space) Mobile-Satellite (Earth-to-space) (no airborne transmission) US258 G117
8175–8215 FIXED FIXED-SATELLITE (Earth-to-space) METEOROLOGICAL-SATELLITE (Earth-to-space) MOBILE Earth Exploration-Satellite (space-to-Earth) 813 815	8175–8215 EARTH EXPLORATION-SATELLITE (space-to-Earth) FIXED FIXED-SATELLITE (Earth-to-space) METEOROLOGICAL-SATELLITE (Earth-to-space) MOBILE 814	8175–8215 FIXED FIXED-SATELLITE (Earth-to-space) METEOROLOGICAL-SATELLITE (Earth-to-space) MOBILE Earth Exploration-Satellite (space-to-Earth) 813 815	8175–8215 EARTH EXPLORATION-SATELLITE (space-to-Earth) FIXED FIXED-SATELLITE (Earth-to-space) METEOROLOGICAL-SATELLITE (Earth-to-space) Mobile-Satellite (Earth-to-space) (no airborne transmissions) US258 G104 G117
8215–8400 FIXED FIXED-SATELLITE (Earth-to-space) MOBILE Earth Exploration-Satellite (space-to-Earth) 813 815	8125–8400 EARTH EXPLORATION-SATELLITE (space-to-Earth) FIXED FIXED-SATELLITE (Earth-to-space) MOBILE 814	8215–8400 FIXED FIXED-SATELLITE (Earth-to-space) MOBILE Earth Exploration-Satellite (space-to-Earth) 813 815	8215–8400 EARTH EXPLORATION SATELLITE (space-to-Earth) FIXED FIXED-SATELLITE (Earth-to-space) Mobile-Satellite (Earth-to-space) (no airborne transmissions) US258 G117

International table			United States table		FCC use designators	
Region 1—allocation MHz	Region 2—allocation MHz	Region 3—allocation MHz	Government Allocation MHz	Non-Government Allocation MHz	Rule part(s)	Special-use frequencies
(1)	(2)	(3)	(4)	(5)	(6)	(7)
8400–8500	FIXED MOBILE except aeronautical mobile SPACE RESEARCH (space-to-Earth) 816 817 818		8400–8450 FIXED SPACE RESEARCH (space-to-Earth) (deep space only)	809 US252 US258		
			8450–8500 FIXED SPACE RESEARCH (space-to-Earth)	8450–8500 SPACE RESEARCH (space-to-Earth)		
8500–8750	RADIOLOCATION 713 819 820		8500–9000 RADIOLOCATION 713 US53 US110 G59	8500–9000 Radiolocation 713 US53 US110		
8750–8850	RADIOLOCATION AERONAUTICAL RADIONAVIGATION 821 822					
8850–9000	RADIOLOCATION MARITIME RADIONAVIGATION 823 824					
9000–9200	AERONAUTICAL RADIONAVIGATION 717 Radiolocation 822		9000–9200 AERONAUTICAL RADIONAVIGATION 717 Radiolocation US48 US54 G2 G19	9000–9200 AERONAUTICAL RADIONAVIGATION 717 Radiolocation US48 US54	AVIATION (87)	
9200–9300	RADIOLOCATION MARITIME RADIONAVIGATION 823		9200–9300 MARITIME RADIONAVIGATION RADIOLOCATION	9200–9300 MARITIME RADIONAVIGATION Radiolocation		

	824 824A		US110 G59 823 824A	US110 823 824A		
9300–9500	RADIONAVIGATION RADIOLOCATION 825A 775A 824A 825		9300–9500 RADIONAVIGATION 825A Meteorological Aids Radiolocation 775A 824A US51 US66 US67 US71 G56	9300–9500 RADIONAVIGATION 825A Meterological Aids Radiolocation 775A 824A US51 US66 US67 US71		
9500–9800	RADIOLOCATION RADIONAVIGATION 713		9500–10,000 RADIOLOCATION	9500–10,000 Radiolocation		
9800–10,000	RADIOLOCATION Fixed 826 827 828		713 828 US110	713 828 US110		

International table			United States table		FCC use designators	
			Government	Non-Government		
Region 1—allocation GHz	Region 2—allocation GHz	Region 3—allocation GHz	Allocation GHz	Allocation GHz	Rule part(s)	Special-use frequencies
(1)	(2)	(3)	(4)	(5)	(6)	(7)
10.0–10.45 FIXED MOBILE RADIOLOCATION Amateur 828	10.00–10.45 RADIOLOCATION Amateur 828 829	10.00–10.45 FIXED MOBILE RADIOLOCATION Amateur 828	10.0–10.45 RADIOLOCATION 828 US58 US108 G32	10.0–10.45 Amateur Radiolocation 828 US58 US108 NG42	Amateur (97) Private Land Mobile (90)	
10.45–10.5	RADIOLOCATION Amateur Amateur-Satellite 830		10.45–10.50 RADIOLOCATION US58 US108 G32	10.45–10.50 Amateur Amateur-Satellite Radiolocation US58 US108 NG42 NG134	Amateur (97) Private Land Mobile (90)	
10.50–10.55 FIXED MOBILE Radiolocation	10.50–10.55 FIXED MOBILE RADIOLOCATION		10.50–10.55 RADIOLOCATION US59	10.50–10.55 RADIOLOCATION US59	PRIVATE LAND MOBILE (90)	

International table			United States table		FCC use designators	
Region 1—allocation GHz	Region 2—allocation GHz	Region 3—allocation GHz	Government Allocation GHz	Non-Government Allocation GHz	Rule part(s)	Special-use frequencies
(1)	(2)	(3)	(4)	(5)	(6)	(7)
10.55–10.60	FIXED MOBILE except aeronautical mobile Radiolocation		10.55–10.60	10.55–10.60 FIXED	DOMESTIC PUBLIC FIXED (21) PRIVATE OPERATIONAL–FIXED MICROWAVE (94)	
10.60–10.68	EARTH EXPLORATION-SATELLITE (passive) FIXED MOBILE except aeronautical mobile RADIO ASTRONOMY SPACE RESEARCH (passive) Radiolocation 831 832		10.60–10.68 EARTH EXPLORATION-SATELLITE (passive) SPACE RESEARCH (passive) US265 US277	10.60–10.68 EARTH EXPLORATION-SATELLITE (passive) FIXED SPACE RESEARCH (passive) US265 US277	DOMESTIC PUBLIC FIXED (21) PRIVATE OPERATIONAL-FIXED MICROWAVE (94)	
10.68–10.70	EARTH EXPLORATION-STATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 833 834		10.68–10.70 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) US74 US246	10.68–10.70 EARTH EXPLORATION-STATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) US74 US246		
10.7–11.7 FIXED FIXED-SATELLITE (space-to Earth) (Earth-to-space) 835 MOBILE except aeronautical mobile 792A	10.7–11.7 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile 792A		10.7–11.7 US211	10.7–11.7 FIXED FIXED-SATELLITE (space-to-Earth) 792A US211 NG41 NG104	DOMESTIC PUBLIC FIXED (21) PRIVATE OPERATIONAL-FIXED MICROWAVE (94)	

11.7–12.5 FIXED BROADCASTING BROADCASTING-SATELLITE Mobile except aeronautical mobile 838	11.7–12.1 FIXED 837 FIXED-SATELLITE (space-to Earth) Mobile except aeronautical mobile 836 839	11.7–12–2 FIXED MOBILE except aeronautical mobile BROADCASTING BROADCASTING-SATELLITE 838	11.7–12.2 839	11.7–12.2 FIXED-SATELLITE (space-to Earth) Mobile except aeronautical mobile 837 839 NG143 NG145	DOMESTIC PUBLIC FIXED (21) SATELLITE COMMUNICATION (25)	
	12.1–12.2 FIXED-SATELLITE (space-to-Earth) 836 839 842	12.2–12.5 FIXED MOBILE except aeronautical mobile BROADCASTING 838 845	12.2–12.7 839 843 844	12.2–12.7 FIXED BROADCASTING-SATELLITE 839 843 844 NG139	INTERNATIONAL PUBLIC (23) PRIVATE OPERATIONAL-FIXED MICROWAVE (94) DIRECT BROADCAST SATELLITE SERVICE (100)	
12.5–12.75 FIXED-SATELLITE (space-to-Earth) (Earth-to-space)	12.2–12.7 FIXED MOBILE except aeronautical mobile BROADCASTING BROADCASTING-SATELLITE 839 844 846	12.5–12.75 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile BROADCASTING-SATELLITE 847				

International table			United States table		FCC use designators	
Region 1—allocation GHz	Region 2—allocation GHz	Region 3—allocation GHz	Government Allocation GHz	Non-Government Allocation GHz	Rule part(s)	Special-use frequencies
(1)	(2)	(3)	(4)	(5)	(6)	(7)
848 849 850	12.7–12.75 FIXED FIXED-SATELLITE MOBILE except aeronautical mobile		12.7–12.75	12.7–12.75 FIXED FIXED-SATELLITE (Earth-to-space) MOBILE NG53 NG118	AUXILIARY BROADCASTING (74) CABLE TELEVISION RELAY (78) PRIVATE OPERATIONAL-FIXED MICROWAVE (94)	
12.75–13.25	FIXED FIXED-SATELLITE (Earth-to-space) MOBILE Space Research (deep space) (space-to-Earth) 792A		12.75–13.25 US251	12.75–13.25 FIXED FIXED-SATELLITE (Earth-to-space) MOBILE 792A US251 NG53 NG104 NG118	AUXILIARY BROADCASTING (74) CABLE TELEVISION RELAY (78) DOMESTIC PUBLIC FIXED (21) PRIVATE OPERATIONAL-FIXED MICROWAVE (94)	
13.25–13.40	AERONAUTICAL RADIONAVIGATION 851 852 853		13.25–13.40 AERONAUTICAL RADIONAVIGATION 851 Space Research (Earth-to-space)	13.25–13.40 AERONAUTICAL RADIONAVIGATION 851 Space Research (Earth-to-space)	AVIATION (87)	
13.4–14.0	RADIOLOCATION Standard Frequency and Time Signal-Satellite (Earth-to-space) Space Research 713 853 854 855		13.4–14.0 RADIOLOCATION Standard Frequency and Time Signal-Satellite (Earth-to-space) Space Research 713 US110 G59	13.4–14.0 Radiolocation Standard Frequency and Time Signal-Satellite (Earth-to-space) Space Research 713 US110	PRIVATE LAND MOBILE (90)	

14.00–14.25	FIXED-SATELLITE (Earth-to-space) 858 RADIONAVIGATION 856 Space Research 857 859		14.0–14.2 RADIONAVIGATION Space Research US287 292	14.0–14.2 FIXED-SATELLITE (Earth-to-space) RADIONAVIGATION Space Research US287 US292	Aviation (87) MARITIME (80) SATELLITE COMMUNICATION (25)	
			14.2–14.3 US287	14.2–14.3 Fixed-satellite (Earth-to-space) Mobile except aeronautical mobile US287	Satellite communications (25) Domestic public fixed (21)	
14.25–14.30	FIXED-SATELLITE (Earth-to-space) 858 RADIONAVIGATION 856 Space Research 857 859 860 861					
14.3–14.4 FIXED FIXED-SATELLITE (Earth-to-space) 858 MOBILE except aeronautical mobile Radionavigation-Satellite 859	14.3–14.4 FIXED-SATELLITE (Earth-to-space) 858 Radionavigation-Satellite 859	14.3–14.4 FIXED FIXED-SATELLITE (Earth-to-space) 858 MOBILE except aeronautical mobile Radionavigation-Satellite 859	14.3–14.4 US287	14.3–14.4 Fixed-satellite (Earth-to-space) Mobile except aeronautical mobile US287	Satellite communication (25) Domestic public fixed (21)	
14.40–14.47	FIXED FIXED-SATELLITE (Earth-to-space) 858 MOBILE except aeronautical mobile Space Research (space-to-Earth) 859		14.4–14.5 Fixed Mobile 862 US203 US287	14.4–14.5 FIXED-SATELLITE (Earth-to-space) 862 US203 US287	SATELLITE COMMUNICATION (25)	
14.47–14.50	FIXED FIXED-SATELLITE (Earth-to-space) 858 MOBILE except aeronautical mobile Radio Astronomy 859 862					

International table			United States table		FCC use designators	
			Government	Non-Government		
Region 1—allocation GHz	Region 2—allocation GHz	Region 3—allocation GHz	Allocation GHz	Allocation GHz	Rule part(s)	Special-use frequencies
(1)	(2)	(3)	(4)	(5)	(6)	(7)
14.5–14.8	FIXED FIXED-SATELLITE (Earth-to-space) 863 MOBILE Space Research		14.5000–14.7145 FIXED Mobile Space Research	14.50–15.35		
			14.7145–15.1365 MOBILE Fixed Space Research US310 G119			
14.80–15.35	FIXED MOBILE Space Research 720		15.1365–15.35 FIXED Mobile Space Research 720 US211	720 US211 US310		
15.35–15.40	EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 864 865		15.35–15.40 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) US74 US246	15.35–15.40 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) US74 US246		
15.4–15.7	AERONAUTICAL RADIO-NAVIGATION 733 797		15.4–15.7 AERONAUTICAL RADIO-NAVIGATION 733 797 US211 US260	15.4–15.7 AERONAUTICAL RADIO-NAVIGATION 733 797 US211 US260	AVIATION (87)	
15.7–16.6	RADIOLOCATION 866 867		15.7–16.6 RADIOLOCATION US110 G59	15.7–17.2 Radiolocation	Private Land Mobile (90)	

16.6–17.1	RADIOLOCATION Space Research (deep space) (Earth-to-space) 866 867		16.6–17.1 RADIOLOCATION Space Research (deep space) (Earth-to-space) US110 G59			
17.1–17.2	RADIOLOCATION 866 867		17.1–17.2 RADIOLOCATION US110 G59	US110		
17.2–17.3	RADIOLOCATION Earth Exploration-Satellite (active) Space Research (active) 866 867		17.2–17.3 RADIOLOCATION Earth Exploration-Satellite (active) Space Research (active) US110 G59	17.2–17.3 Radiolocation Earth Exploration-Satellite (active) Space Research (active) US110	Private Land Mobile (90)	
17.3–17.7	FIXED-SATELLITE (Earth-to-space) 869 Radiolocation 868		17.3–17.7 Radiolocation US259 US271 G59	17.3–17.7 FIXED-SATELLITE (Earth-to-space) US259 US271 NG140		
17.7–17.8 FIXED FIXED-SATELLITE (space-to-Earth) (Earth-to-space) 869 MOBILE	17.7–17.8 FIXED FIXED-SATELLITE (space-to-Earth) (Earth-to-space) 869 MOBILE	17.7–17.8 FIXED FIXED-SATELLITE (space-to-Earth) (Earth-to-space) 869 MOBILE	17.7–17.8 US271	17.7–17.8 FIXED FIXED-SATELLITE (space-to-Earth) (Earth-to-space) MOBILE US271 NG140 NG144	AUXILIARY BROADCASTING (74) CABLE TELEVISION RELAY (78) DOMESTIC PUBLIC FIXED (21) PRIVATE OPERATIONAL-FIXED MICROWAVE (94)	
17.8–18.1 FIXED FIXED-SATELLITE (space-to-Earth) (Earth-to-space) 869 MOBILE	17.8–18.1 FIXED FIXED-SATELLITE (space-to-Earth) (Earth-to-space) 869 MOBILE	17.8–18.1 FIXED FIXED-SATELLITE (space-to-Earth) (Earth-to-space) 869 MOBILE	17.8–18.1 US334 G117	17.8–18.1 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE US334 NG144	AUXILIARY BROADCASTING (74) CABLE TELEVISION RELAY (78) DOMESTIC PUBLIC FIXED (21) PRIVATE OPERATIONAL-FIXED MICROWAVE (94)	

International table			United States table		FCC use designators	
Region 1—allocation GHz	Region 2—allocation GHz	Region 3—allocation GHz	Government Allocation GHz	Non-Government Allocation GHz	Rule part(s)	Special-use frequencies
(1)	(2)	(3)	(4)	(5)	(6)	(7)
18.1–18.6 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE 870	18.1–18.6 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE 870	18.1–18.6 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE 870	18.1–18.6 870 US334 G117	18.1–18.6 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE 870 US334 NG144	AUXILIARY BROADCASTING (74) CABLE TELEVISION RELAY (78) DOMESTIC PUBLIC FIXED (21) PRIVATE OPERATIONAL-FIXED MICROWAVE (94)	
18.6–18.8 FIXED FIXED-SATELLITE (space-to-Earth) 872 MOBILE except aeronautical mobile Earth Exploration-Satellite (passive) Space Research (passive) 871	18.6–18.8 EARTH EXPLORATION-SATELLITE (passive) FIXED FIXED-SATELLITE (space-to-Earth) 872 MOBILE except aeronautical mobile SPACE RESEARCH (passive) 871	18.6–18.8 FIXED FIXED-SATELLITE (space-to-Earth) 872 MOBILE except aeronautical mobile Earth Exploration-Satellite (passive) Space Research (passive) 871	18.6–18.8 EARTH EXPLORATION-SATELLITE (passive) SPACE RESEARCH (passive) US254 US255 US334 G117	18.6–18.8 EARTH EXPLORATION-SATELLITE (passive) FIXED FIXED-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile SPACE RESEARCH (passive) US254 US255 US334 NG144	AUXILIARY BROADCASTING (74) CABLE TELEVISION RELAY (78) DOMESTIC PUBLIC FIXED (21) PRIVATE OPERATIONAL-FIXED MICROWAVE (94)	
18.8–19.7 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE	18.8–19.7 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE	18.8–19.7 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE	18.8–19.7 US334 G117	18.8–19.7 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE US334 NG144	AUXILIARY BROADCASTING (74) CABLE TELEVISION RELAY (78) DOMESTIC PUBLIC FIXED (21) PRIVATE OPERATIONAL-FIXED MICROWAVE (94)	
19.7–20.1 FIXED-SATELLITE (space-to-Earth) Mobile-Satellite (space-to-Earth)	19.7–20.1 FIXED-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth)	19.7–20.1 FIXED-SATELLITE (space-to-Earth) Mobile-Satellite (space-to-Earth)	19.7–20.1	19.7–20.1 FIXED-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth)		

873	873 873A 873B 873C 873D 873E	873	US334 G117	873A 873B 873C 873D 873E US334		
20.1–20.2 FIXED-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 873 873A 873B 873C 873D	20.1–20.2 FIXED-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 873 873A 873B 873C 873D	20.1–20.2 FIXED-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 873 873A 873B 873C 873D	20.1–20.2 US334 G117	20.1–20.2 FIXED-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 873A 873B 873C 873D US334		
21.2–21.4	EARTH EXPLORATION-SATELLITE (passive) FIXED MOBILE SPACE RESEARCH (passive)		21.2–21.4 EARTH EXPLORATION-SATELLITE (passive) FIXED MOBILE SPACE RESEARCH (passive) US263	21.2–21.4 EARTH EXPLORATION-SATELLITE (passive) FIXED MOBILE SPACE RESEARCH (passive) US263	21.2–21.4 DOMESTIC PUBLIC FIXED (21) PRIVATE OPERATIONAL-FIXED MICROWAVE (94)	
21.4–22.0	FIXED MOBILE		21.4–22.0 FIXED MOBILE	21.4–22.0 FIXED MOBILE	DOMESTIC PUBLIC FIXED (21) PRIVATE OPERATIONAL-FIXED MICROWAVE (94)	
22.00–22.21	FIXED MOBILE except aeronautical mobile 874		22.00–22.21 FIXED MOBILE except aeronautical mobile 874	22.00–22.21 FIXED MOBILE except aeronautical mobile 874	DOMESTIC PUBLIC MOBILE (22) PRIVATE OPERATIONAL-FIXED MICROWAVE (94)	
22.21–22.50	EARTH EXPLORATION-SATELLITE (passive) FIXED MOBILE except aeronautical mobile RADIO ASTRONOMY SPACE RESEARCH (passive) 875 876		22.21–22.50 EARTH EXPLORATION-SATELLITE (passive) FIXED MOBILE except aeronautical mobile RADIO ASTRONOMY SPACE RESEARCH (passive) 875 US263	22.21–22.50 EARTH EXPLORATION-SATELLITE (passive) FIXED MOBILE except aeronautical mobile RADIO ASTRONOMY SPACE RESEARCH (passive) 875 US263	DOMESTIC PUBLIC FIXED (21) PRIVATE OPERATIONAL-FIXED MICROWAVE (94)	

International table			United States table		FCC use designators	
			Government	Non-Government		
Region 1—allocation GHz	Region 2—allocation GHz	Region 3—allocation GHz	Allocation GHz	Allocation GHz	Rule part(s)	Special-use frequencies
(1)	(2)	(3)	(4)	(5)	(6)	(7)
22.50–22.55 FIXED MOBILE	22.50–22.55 FIXED MOBILE	22.50–22.55 FIXED MOBILE	22.50–22.55 FIXED MOBILE US211	22.50–22.55 FIXED MOBILE US211	DOMESTIC PUBLIC FIXED (21) PRIVATE OPERATIONAL-FIXED MICROWAVE (94)	
22.55–23 FIXED INTER-SATELLITE MOBILE 879	22.55–23 FIXED INTER-SATELLITE MOBILE 879	22.55–23 FIXED INTER-SATELLITE MOBILE 879	22.55–23 FIXED INTER-SATELLITE MOBILE 879 US278	22.55–23 FIXED INTER-SATELLITE MOBILE 879 US278	DOMESTIC PUBLIC FIXED (21) PRIVATE OPERATIONAL-FIXED MICROWAVE (94) SATELLITE COMMUNICATIONS (25)	
23.00–23.55	FIXED INTER-SATELLITE MOBILE 879		23.00–23.55 FIXED INTER-SATELLITE MOBILE 879 US278	23.00–23.55 FIXED INTER-SATELLITE MOBILE 879 US278	DOMESTIC PUBLIC FIXED (21) PRIVATE OPERATIONAL-FIXED MICROWAVE (94)	
23.55–23.60	FIXED MOBILE		23.55–23.60 FIXED MOBILE	23.55–23.60 FIXED MOBILE	DOMESTIC PUBLIC FIXED (21) PRIVATE OPERATIONAL-FIXED MICROWAVE (94)	
23.6–24.0	EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 880		23.6–24.0 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) US74 US246	23.6–24.0 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) US74 US246		

24.00–24.05	AMATEUR AMATEUR-SATELLITE 881		24.00–24.05 881 US211	24.00–24.05 AMATEUR AMATEUR-SATELLITE 881 US211	AMATEUR (97)	
24.05–24.25	RADIOLOCATION Amateur Earth Exploration-Satellite (active) 881		24.05–24.25 RADIOLOCATION Earth Exploration-Satellite (active) 881 US110 G59	24.05–24.25 Amateur Radiolocation Earth Exploration-Satellite (active) 881 US110	Amateur (97) Private Land Mobile (90)	24.125±125 GHz: Industrial, scientific and medical frequency
24.25–24.45 FIXED	24.25–24.45 RADIONAVIGATION	24.25–24.45 RADIONAVIGATION FIXED MOBILE	24.25–24.45 RADIONAVIGATION	24.25–24.45 RADIONAVIGATION	AVIATION (87)	
24.45–24.65 FIXED INTER-SATELLITE	24.45–24.65 RADIONAVIGATION INTER-SATELLITE 882E	24.45–24.65 RADIONAVIGATION FIXED INTER-SATELLITE MOBILE 882E	24.45–24.65 INTER-SATELLITE RADIONAVIGATION 882E	24.45–24.65 INTER-SATELLITE RADIONAVIGATION 882E	SATELLITE COMMUNICATION (25)	
24.65–24.75 FIXED INTER-SATELLITE	24.65–24.75 INTER-SATELLITE RADIOLOCATION-SATELLITE (Earth-to-space)	24.65–24.75 FIXED INTER-SATELLITE MOBILE 882E 882F	24.65–24.75 INTER-SATELLITE RADIOLOCATION-SATELLITE (Earth-to-space)	24.65–24.75 INTER-SATELLITE RADIOLOCATION-SATELLITE (Earth-to-space)	SATELLITE COMMUNICATION (25)	
24.75–25.25 FIXED	24.75–25.25 FIXED-SATELLITE (Earth-to-space) 882G	24.75–25.25 FIXED FIXED-SATELLITE (Earth-to-space) 882G 882F	24.75–25.25 RADIONAVIGATION		AVIATION (87)	
25.25–27.00	FIXED MOBILE Earth Exploration-Satellite (space-to-space) Standard Frequency and Time Signal-Satellite (Earth-to-space)		25.25–27.00 FIXED MOBILE Earth Exploration-Satellite (space-to-space) Standard Frequency and Time Signal-Satellite (Earth-to-space)	25.25–27.00 Earth Exploration-Satellite (space-to-space) Standard Frequency and Time Signal-Satellite (Earth-to-space)		

International table			United States table		FCC use designators	
Region 1—allocation GHz	Region 2—allocation GHz	Region 3—allocation GHz	Government Allocation GHz	Non-Government Allocation GHz	Rule part(s)	Special-use frequencies
(1)	(2)	(3)	(4)	(5)	(6)	(7)
27.0–27.5 FIXED MOBILE Earth Exploration-Satellite (space-to-space)	27.0–27.5 FIXED FIXED-SATELLITE (Earth-to-space) MOBILE Earth Exploration-Satellite (space-to-space)		27.0–27.5 FIXED MOBILE Earth Exploration-Satellite (space-to-space)	27.0–27.5 Earth Exploration-Satellite (space-to-space)		
27.5–29.5	FIXED FIXED-SATELLITE (Earth-to-space) MOBILE		27.5–29–5	27.5–29.5 FIXED FIXED-SATELLITE (Earth-to-space) MOBILE	DOMESTIC PUBLIC FIXED (21)	
29.5–29.9 FIXED-SATELLITE (Earth-to-space) 882D MOBILE-SATELLITE (Earth-to-space) Earth Exploration-Satellite (Earth-to-space) 882C 882B 883	29.5–29.9 FIXED-SATELLITE (Earth-to-space) 882D MOBILE-SATELLITE (Earth-to-space) Earth Exploration-Satellite (Earth-to-space) 882C 873A 873B 873C 873E 882B 883	29.5–29.9 FIXED-SATELLITE (Earth-to-space) 882D MOBILE-SATELLITE (Earth-to-space) Earth Exploration-Satellite (Earth-to-space) 882C 882B 883	29.5–29.9	29.5–29.9 FIXED-SATELLITE (Earth-to-space) MOBILE-SATELLITE (Earth-to-space) 873A 873B 873C 873E		
29.9–30.0 FIXED-SATELLITE (Earth-to-space) MOBILE-SATELLITE (Earth-to-space) Earth Exploration-Satellite (Earth-to-space) 882C 873A 873B 873C 882 882A 882B 883	29.9–3.0 FIXED-SATELLITE (Earth-to-space) MOBILE-SATELLITE (Earth-to-space) Earth Exploration-Satellite (Earth-to-space) 882C 873A 873B 873C 882 882A 882B 883	29.9–30.0 FIXED-SATELLITE (Earth-to-space) MOBILE-SATELLITE (Earth-to-space) Earth Exploration-Satellite (Earth-to-space) 882C 873A 873B 873C 882 882A 882B 883	29.9–30.0	29.9–30.0 FIXED-SATELLITE (Earth-to-space) MOBILE-SATELLITE (Earth-to-space) 873A 873B 873C 882		
30.0–31.0	FIXED-SATELLITE (Earth-to-space) MOBILE-SATELLITE (Earth-to-space) Standard Frequency and Time Signal-Satellite (space-to-Earth)		30.0–31.0 FIXED-SATELLITE (Earth-to-space) MOBILE-SATELLITE (Earth-to-space) Standard Frequency and Time Signal-Satellite (space-to-Earth)	30.0–31.0 Standard Frequency and Time Signal-Satellite (space-to-Earth)		

	883		G117			
31.0–31.3	FIXED MOBILE Standard Frequency and Time Signal-Satellite (space-to-Earth) Space Research 884 885 886		31.0–31.3 Standard Frequency and Time Signal-Satellite (space-to-Earth) 886 US211	31.0–31.3 FIXED MOBILE Standard Frequency and Time Signal-Satellite (space-to-Earth) 884 886 US211	AUXILIARY BROADCASTING (74) DOMESTIC PUBLIC FIXED (21) CABLE TELEVISION RELAY (78) GENERAL MOBILE RADIO (95) PRIVATE OPERATIONAL-FIXED MICROWAVE (94)	
31.3–31.5	EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 887		31.3–31.8 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive)	31.3–31.8 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive)		
31.5–31.8 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) Fixed Mobile except aeronautical mobile 888 889	31.5–31.8 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 888	31.5–31.8 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) Fixed Mobile except aeronautical mobile 888	US74 US246	US74 US246		
31.8–32.0	RADIONAVIGATION Space Research 890 891 892		31.8–32.0 RADIONAVIGATION US69 US211 US262	31.8–32.0 RADIONAVIGATION US69 US211 US262		
32.0–32.3	INTER-SATELLITE RADIONAVIGATION Space Research 890 891 892 893		32.0–33.0 INTER-SATELLITE RADIONAVIGATION	32.0–33.0 INTER-SATELLITE RADIONAVIGATION		

International table			United States table		FCC use designators	
Region 1—allocation GHz	Region 2—allocation GHz	Region 3—allocation GHz	Government Allocation GHz	Non-Government Allocation GHz	Rule part(s)	Special-use frequencies
(1)	(2)	(3)	(4)	(5)	(6)	(7)
32.3–33.0	INTER-SATELLITE RADIONAVIGATION 892 893					
33.0–33.4	RADIONAVIGATION 892		33.0–33.4 RADIONAVIGATION US69	33.0–33.4 RADIONAVIGATION US69		
33.4–34.2	RADIOLOCATION 892 894		33.4–36.0 RADIOLOCATION	33.4–36.0 Radiolocation	Private Land Mobile (90)	
34.2–35.2	RADIOLOCATION Space Research 895 896 894					
35.2–36.0	METEOROLOGICAL AIDS RADIOLOCATION 894 897		897 US110 US252 G34	897 US110 US252		
36.0–37.0	EARTH EXPLORATION-SATELLITE (passive) FIXED MOBILE SPACE RESEARCH (passive) 898		36.0–37.0 EARTH EXPLORATION-SATELLITE (passive) FIXED MOBILE SPACE RESEARCH (passive) 898 US263	36.0–37.0 EARTH EXPLORATION-SATELLITE (passive) FIXED MOBILE SPACE RESEARCH (passive) 898 US263		
37.0–37.5	FIXED MOBILE 899		37.0–38.6 FIXED MOBILE	37.0–38.6 FIXED MOBILE	DOMESTIC PUBLIC FIXED (21) PRIVATE OPERATIONAL-FIXED MICROWAVE (94)	

37.5–39.5	FIXED FIXED-SATELLITE (space-to-Earth) MOBILE 899					
			38.6–39.5 US291	38.6–39.5 FIXED MOBILE FIXED-SATELLITE (space-to-Earth) US291	DOMESTIC PUBLIC FIXED (21) PRIVATE OPERATIONAL-FIXED MICROWAVE (90) Auxiliary Broadcasting (74)	
39.5–40.5	FIXED FIXED-SATELLITE (space-to-Earth) MOBILE MOBILE-SATELLITE (space-to-Earth)		39.5–40.0 FIXED-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) US291 G117	39.5–40.0 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE MOBILE-SATELLITE (space-to-Earth) US291	DOMESTIC PUBLIC FIXED (21) PRIVATE OPERATIONAL-FIXED MICROWAVE (94) Auxiliary Broadcasting (74)	
			40.0–40.5 FIXED-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) G117	40.0–40.5 FIXED-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth)		
40.5–42.5	BROADCASTING-SATELLITE /BROADCASTING/ Fixed Mobile		40.5–42.5 US211	40.5–42.5 BROADCASTING-SATELLITE /BROADCASTING/ Fixed Mobile US211		
42.5–43.5	FIXED FIXED-SATELLITE (Earth-to-space) 901 MOBILE except aeronautical mobile RADIO ASTRONOMY 900		42.5–43.5 FIXED FIXED-SATELLITE (Earth-to-space) MOBILE except aeronautical mobile RADIO ASTRONOMY 900	42.5–43.5 FIXED FIXED-SATELLITE (Earth-to-space) MOBILE except aeronautical mobile RADIO ASTRONOMY 900		

International table			United States table		FCC use designators	
Region 1—allocation GHz	Region 2—allocation GHz	Region 3—allocation GHz	Government Allocation GHz	Non-Government Allocation GHz	Rule part(s)	Special-use frequencies
(1)	(2)	(3)	(4)	(5)	(6)	(7)
43.5–45.5 MOBILE 902 MOBILE-SATELLITE RADIONAVIGATION RADIONAVIGATION-SATELLITE 903	43.5–45.5 MOBILE 902 MOBILE-SATELLITE RADIONAVIGATION RADIONAVIGATION-SATELLITE 903	43.5–45.5 MOBILE 902 MOBILE-SATELLITE RADIONAVIGATION RADIONAVIGATION-SATELLITE 903	43.5–45.5 FIXED-SATELLITE (Earth-to-space) MOBILE-SATELLITE (Earth-to-space) G117	43.5–45.5		
45.5–47.0 MOBILE 902 MOBILE-SATELLITE RADIONAVIGATION RADIONAVIGATION-SATELLITE	45.5–47.0 MOBILE 902 MOBILE-SATELLITE RADIONAVIGATION RADIONAVIGATION-SATELLITE 903	45.5–47.0 MOBILE 902 MOBILE-SATELLITE RADIONAVIGATION RADIONAVIGATION-SATELLITE	45.5–47.0 MOBILE MOBILE-SATELLITE (Earth-to-space) RADIONAVIGATION-SATELLITE 903	45.5–47.0 MOBILE MOBILE-SATELLITE (Earth-to-space) RADIONAVIGATION-SATELLITE 903	RADIO FREQUENCY DEVICES (15)	
47.0–47.2	AMATEUR AMATEUR-SATELLITE		47.0–47.2	47.0–47.2 AMATEUR AMATEUR-SATELLITE	AMATEUR (97)	
47.2–50.2	FIXED FIXED-SATELLITE (Earth-to-space) 901 MOBILE 905 904		47.2–50.2 FIXED FIXED-SATELLITE (Earth-to-space) MOBILE 904 US264 US297	47.2–50.2 FIXED FIXED-SATELLITE (Earth-to-space) MOBILE 904 US264 US297		
50.2–50.4	EARTH EXPLORATION-SATELLITE (passive) FIXED MOBILE SPACE RESEARCH (passive)		50.2–50.4 EARTH EXPLORATION-SATELLITE (passive) FIXED MOBILE SPACE RESEARCH (passive) US263	50.2–50.4 EARTH EXPLORATION-SATELLITE (passive) FIXED MOBILE SPACE RESEARCH (passive) US263		

50.4–51.4	FIXED FIXED-SATELLITE (Earth-to-space) MOBILE Mobile-Satellite (Earth-to-space)		50.4–51.4 FIXED FIXED-SATELLITE (Earth-to-space) MOBILE MOBILE-SATELLITE (Earth-to-space) G117	50.4–51.4 FIXED FIXED-SATELLITE (Earth-to-space) MOBILE MOBILE-SATELLITE (Earth-to-space)		
51.4–54.25	EARTH EXPLORATION-SATELLITE (passive) SPACE RESEARCH (passive) 906 907		51.4–54.25 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) US246	51.4–54.25 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) US246		
54.25–58.2	EARTH EXPLORATION-SATELLITE (passive) FIXED INTER-SATELLITE MOBILE 909 SPACE RESEARCH (passive) 908		54.25–58.2 EARTH EXPLORATION-SATELLITE (passive) FIXED INTER-SATELLITE MOBILE 909 SPACE RESEARCH (passive) US263	54.25–58.2 EARTH EXPLORATION-SATELLITE (passive) FIXED INTER-SATELLITE MOBILE 909 SPACE RESEARCH (passive) US263		
58.2–59.0	EARTH EXPLORATION-SATELLITE (passive) SPACE RESEARCH (passive) 906 907		58.2–59.0 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) US246	58.2–59.0 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) US246		
59–64 FIXED INTER-SATELLITE MOBILE 909 RADIOLOCATION 910 911	59–64 FIXED INTER-SATELLITE MOBILE 909 RADIOLOCATION 911	59–64 FIXED INTER-SATELLITE MOBILE 909 RADIOLOCATION 911	59–64 FIXED INTER-SATELLITE MOBILE 909 RADIOLOCATION 911	59–64 FIXED INTER-SATELLITE MOBILE 909 RADIOLOCATION 911	Radio frequency devices (15)	61.25 GHz±250 MHz: Industrial, scientific and medical frequency

International table			United States table		FCC use designators	
Region 1—allocation GHz	Region 2—allocation GHz	Region 3—allocation GHz	Government Allocation GHz	Non-Government Allocation GHz	Rule part(s)	Special-use frequencies
(1)	(2)	(3)	(4)	(5)	(6)	(7)
64–65	EARTH EXPLORATION-SATELLITE (passive) SPEACE RESEARCH (passive) 906 907		64–65 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) US246	64–65 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) US246		
65–66	EARTH EXPLORATION-SATELLITE SPACE RESEARCH Fixed Mobile		65–66 EARTH EXPLORATION-SATELLITE SPACE RESEARCH Fixed Mobile	65–66 EARTH EXPLORATION-SATELLITE SPACE RESEARCH Fixed Mobile		
66–71	MOBILE 902 MOBILE-SATELLITE RADIONAVIGATION RADIONAVIGATION-SATELLITE 903		66–71 MOBILE 902 MOBILE-SATELLITE RADIONAVIGATION RADIONAVIGATION-SATELLITE 903	66–71 MOBILE 902 MOBILE-SATELLITE RADIONAVIGATION RADIONAVIGATION-SATELLITE 903		
71–74	FIXED FIXED-SATELLITE (Earth-to-space) MOBILE MOBILE-SATELLITE (Earth-to-space) 906	FIXED FIXED-SATELLITE (Earth-to-space) MOBILE MOBILE-SATELLITE (Earth-to-space)	71–74 FIXED FIXED-SATELLITE (Earth-to-space) MOBILE MOBILE-SATELLITE (Earth-to-space) US270	71–74 US270		
74.0–75.5	FIXED FIXED-SATELLITE (Earth-to-space) MOBILE		74.0–75.5 FIXED FIXED-SATELLITE (Earth-to-space) MOBILE US297	74.0–75.5 FIXED FIXED-SATELLITE (Earth-to-space) MOBILE US297		

75.5–76.0	AMATEUR AMATEUR-SATELLITE		75.5–76.0	75.5–76.0 AMATEUR AMATEUR-SATELLITE	AMATEUR (97)	
76–77 RADIOLOCATION Amateur Amateur-Satellite Space Research (space-to-Earth)	76–77 RADIOLOCATION Amateur Amateur-Satellite Space Research (space-to-Earth)	76–77 RADIOLOCATION Amateur Amateur-Satellite Space Research (space-to-Earth)	76–77 RADIOLOCATION	76–77 RADIOLOCATION Amateur	RADIO FREQUENCY DEVICES (15)	
77–81 RADIOLOCATION Amateur Amateur-Satellite Space Research (space-to-Earth)	77–81 RADIOLOCATION Amateur Amateur-Satellite Space Research (space-to-Earth)	77–81 RADIOLOCATION Amateur Amateur-Satellite Space Research (space-to-Earth)	77–81 912	77–81 RADIOLOCATION Amateur Amateur-Satellite 912	Amateur (97)	
81–84	FIXED FIXED-SATELLITE (space-to-Earth) MOBILE MOBILE-SATELLITE (space-to-Earth)		81–84 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE MOBILE-SATELLITE (space-to-Earth)	81–84 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE MOBILE-SATELLITE (space-to-Earth)		
84–86	FIXED MOBILE BROADCASTING BROADCASTING-SATELLITE 913		84–86 FIXED MOBILE 913 US211	84–86 FIXED MOBILE BROADCASTING BROADCASTING-SATELLITE 913 US211		
86–92	EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 907		86–92 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) US74 US246	86–92 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) US74 US246		
92–95	FIXED FIXED-SATELLITE (Earth-to-space) MOBILE RADIOLOCATION		92–95 FIXED FIXED-SATELLITE (Earth-to-space) MOBILE RADIOLOCATION	92–95 FIXED FIXED-SATELLITE (Earth-to-space) MOBILE RADIOLOCATION		

International table			United States table		FCC use designators	
Region 1—allocation GHz	Region 2—allocation GHz	Region 3—allocation GHz	Government Allocation GHz	Non-Government Allocation GHz	Rule part(s)	Special-use frequencies
(1)	(2)	(3)	(4)	(5)	(6)	(7)
	914		914	914		
95–100	MOBILE 902 MOBILE-SATELLITE RADIONAVIGATION RADIONAVIGATION-SATELLITE Radiolocation 903 904		95–100 MOBILE 902 MOBILE-SATELLITE RADIONAVIGATION RADIONAVIGATION-SATELLITE Radiolocation 903 904	95–100 MOBILE 902 MOBILE-SATELLITE RADIONAVIGATION RADIONAVIGATION-SATELLITE Radiolocation 903 904		
100–102	EARTH EXPLORATION-SATELLITE (passive) FIXED MOBILE SPACE RESEARCH (passive) 722		100–102 EARTH EXPLORATION-SATELLITE (passive) SPACE RESEARCH (passive) 722 US246	100–102 EARTH EXPLORATION-SATELLITE (passive) SPACE RESEARCH (passive) 722 US246		
102–105	FIXED FIXED-SATELLITE (space-to-Earth) 722		102–105 FIXED FIXED-SATELLITE (space-to-Earth) 722 US211	102–105 FIXED FIXED-SATELLITE (space-to-Earth) 722		
105–116	EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 722 907		105–116 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 722 US74 US246	105–116 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 722 US74 US246		
116–126	EARTH EXPLORATION-SATELLITE (passive) FIXED INTER-SATELLITE MOBILE 909		116–126 EARTH EXPLORATION-SATELLITE (passive) FIXED INTER-SATELLITE MOBILE 909 SPACE RESEARCH (passive)	116–126 EARTH EXPLORATION-SATELLITE (passive) FIXED INTER-SATELLITE MOBILE 909 SPACE RESEARCH (passive)		122.5±5 GHz: Industrial scientific and medical frequency

	722 915 916	722 915 916 US211	722 915 916 US211 US263	US263		
126–134	FIXED INTER-SATELLITE MOBILE 909 RADIOLOCATION 910		126–134 FIXED INTER-SATELLITE MOBILE 909 RADIOLOCATION 910	126–134 FIXED INTER-SATELLITE MOBILE 909 RADIOLOCATION 910		
134–142	MOBILE 902 MOBILE-SATELLITE RADIONAVIGATION RADIONAVIGATION-SAT-ELLITE Radiolocation 903 917 918		134–142 MOBILE 902 MOBILE-SATELLITE RADIONAVIGATION RADIONAVIGATION-SAT-ELLITE Radiolocation 903 917 918	134–142 MOBILE 902 MOBILE-SATELLITE RADIONAVIGATION RADIONAVIGATION-SAT-ELLITE Radiolocation 903 917 818		
142–144	AMATEUR AMATEUR-SATELLITE		142–144	142–144 AMATEUR AMATEUR-SATELLITE	AMATEUR (97)	
144–149	RADIOLOCATION Amateur Amateur-Satellite 918		144–149 RADIOLOCATION 918	144–149 RADIOLOCATION Amateur Amateur-Satellite 918	Amateur (97)	
149–150	FIXED FIXED-SATELLITE (space-to-Earth) MOBILE		149–150 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE	149–150 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE		
150–151	EARTH EXPLORATION-SATELLITE (passive) FIXED FIXED-SATELLITE (space-to-Earth) MOBILE SPACE RESEARCH (pas-sive) 919		150–151 EARTH EXPLORATION-SATELLITE (passive) FIXED FIXED-SATELLITE (space-to-Earth) MOBILE SPACE RESEARCH (pas-sive) 919 US263	150–151 EARTH EXPLORATION-SATELLITE (passive) FIXED FIXED-SATELLITE (space-to-Earth) MOBILE SPACE RESEARCH (pas-sive) 919 US263		
151–164	FIXED FIXED-SATELLITE (space-to-Earth)		151–164 FIXED FIXED-SATELLITE	151–164 FIXED FIXED-SATELLITE		

International table			United States table		FCC use designators	
Region 1—allocation GHz	Region 2—allocation GHz	Region 3—allocation GHz	Government Allocation GHz	Non-Government Allocation GHz	Rule part(s)	Special-use frequencies
(1)	(2)	(3)	(4)	(5)	(6)	(7)
			211	211		
164–168	EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive)		164–168 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) US246	164–168 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) US246		
168–170	FIXED MOBILE		168–170 FIXED MOBILE	168–170 FIXED MOBILE		
170.0–174.5	FIXED INTER-SATELLITE MOBILE 909 919		170.0–174.5 FIXED INTER-SATELLITE MOBILE 909 919	170.0–174.5 FIXED INTER-SATELLITE MOBILE 909 919		
174.5–176.5	EARTH EXPLORATION-SATELLITE (passive) FIXED INTER-SATELLITE MOBILE 909 SPACE RESEARCH (passive) 919		174.5–176.5 EARTH EXPLORATION-SATELLITE (passive) FIXED INTER-SATELLITE MOBILE 909 SPACE RESEARCH (passive) 919 US263	174.5–176.5 EARTH EXPLORATION-SATELLITE (passive) FIXED INTER-SATELLITE MOBILE 909 SPACE RESEARCH (passive) 919 US263		
176.5–182.0	FIXED INTER-SATELLITE MOBILE 909 919		176.5–182.0 FIXED INTER-SATELLITE MOBILE 909 919 US211	176.5–182.0 FIXED INTER-SATELLITE MOBILE 909 919 US211		
182–185	EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive)		182–185 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive)	182–185 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive)		

	920 921		US246	US246		
185–190	FIXED INTER-SATELLITE MOBILE 909 919		185–190 FIXED INTER-SATELLITE MOBILE 909 919 US211	185–190 FIXED INTER-SATELLITE MOBILE 909 919 US211		
190–200	MOBILE 902 MOBILE-SATELLITE RADIONAVIGATION RADIONAVIGATION-SATELLITE 722 903		190–200 MOBILE 902 MOBILE-SATELLITE RADIONAVIGATION RADIONAVIGATION-SATELLITE 722 903	190–200 MOBILE 902 MOBILE-SATELLITE RADIONAVIGATION RADIONAVIGATION-SATELLITE 722 903		
200–202	EARTH EXPLORATION-SATELLITE (passive) FIXED MOBILE SPACE RESEARCH (passive) 722		200–202 EARTH EXPLORATION-SATELLITE (passive) FIXED MOBILE SPACE RESEARCH (passive) 722 US263	200–202 EARTH EXPLORATION-SATELLITE (passive) FIXED MOBILE SPACE RESEARCH (passive) 722 US263		
202–217	FIXED FIXED-SATELLITE (Earth-to-space) MOBILE 722		202–217 FIXED FIXED-SATELLITE (Earth-to-space) MOBILE 722	202–217 FIXED FIXED-SATELLITE (Earth-to-space) MOBILE 722		
217–231	EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 722 907		217–231 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 722 US74 US246	217–231 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 722 US74 US246		
231–235	FIXED FIXED-SATELLITE (space-to-Earth) MOBILE Radiolocation		213–235 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE Radiolocation US211	231–235 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE Radiolocation US211		

International table			United States table		FCC use designators	
			Government	Non-Government		
Region 1—allocation GHz	Region 2—allocation GHz	Region 3—allocation GHz	Allocation GHz	Allocation GHz	Rule part(s)	Special-use frequencies
(1)	(2)	(3)	(4)	(5)	(6)	(7)
235–238	EARTH EXPLORATION-SATELLITE (passive) FIXED FIXED-SATELLITE (space-to-Earth) MOBILE SPACE RESEARCH (passive)		235–238 EARTH EXPLORATION-SATELLITE (passive) FIXED FIXED-SATELLITE (space-to-Earth) MOBILE SPACE RESEARCH (passive) US263	235–238 EARTH EXPLORATION-SATELLITE (passive) FIXED FIXED-SATELLITE (space-to-Earth) MOBILE SPACE RESEARCH (passive) US263		
238–241	FIXED FIXED-SATELLITE (space-to-Earth) MOBILE Radiolocation		238–241 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE Radiolocation	238–241 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE Radiolocation		
241–248	RADIOLOCATION Amateur Amateur-Satellite 922		241–248 RADIOLOCATION 922	241–248 RADIOLOCATION Amateur Amateur-Satellite 922	Amateur (97)	245±1 GHz: Industrial scientific and medical frequency
248–250	AMATEUR AMATEUR-SATELLITE		248–250	248–250 AMATEUR AMATEUR-SATELLITE	AMATEUR (97)	
250–252	EARTH EXPLORATION-SATELLITE (passive) SPACE RESEARCH (passive) 923		250–252 EARTH EXPLORATION-SATELLITE (passive) SPACE RESEARCH (passive) 923	250–252 EARTH EXPLORATION-SATELLITE (passive) SPACE RESEARCH (passive) 923		

252–265	MOBILE 902 MOBILE-SATELLITE RADIONAVIGATION RADIONATIVATION-SAT-ELLITE 903 923 924 925		252–265 MOBILE 902 MOBILE-SATELLITE RADIONAVIGATION RADIONAVIGATION-SAT-ELLITE 903 923 924 US211	252–265 MOBILE 902 MOBILE-SATELLITE RADIONAVIGATION RADIONAVIGATION-SAT-ELLITE 903 923 924 US211		
265–275	FIXED FIXED-SATELLITE (Earth-to-space) MOBILE RADIO ASTRONOMY 926		265–275 FIXED FIXED-SATELLITE (Earth-to-space) MOBILE RADIO ASTRONOMY 926	265–275 FIXED FIXED-SATELLITE (Earth-to-space) MOBILE RADIO ASTRONOMY 926		
275–400	(Not allocated)		275–300 FIXED MOBILE 927	275–300 FIXED MOBILE 927		
	927		Above 300 (Not allocated) 927	Above 300 (Not allocated) 927	Amateur (97)	

INTERNATIONAL FOOTNOTES

444 Administrations authorizing the use of frequencies below 9 kHz shall ensure that no harmful interference is caused thereby to the services to which the bands above 9 kHz are allocated (see also No. 1816).

445 Administrations conducting scientific research using frequencies below 9 kHz are urged to advise other administrations that may be concerned in order that such research may be afforded all practicable protection from harmful interference.

446 *Additional allocation:* In Bulgaria, Hungary, Poland, the German Democratic Republic, Czechoslovakia, and the U.S.S.R., the band 14—17 kHz is also allocated to the radionavigation service on a permitted basis.

447 The stations of services to which the bands 14—19.95 kHz and 20.5—70 kHz and in Region 1 also the bands 72—84 kHz and 86—90 kHz are allocated may transmit standard frequency and time signals. Such stations shall be afforded protection from harmful interference. In Bulgaria, Hungary, Mongolia, Poland, Czechoslovakia, and the U.S.S.R., the frequencies 25 kHz and 50 kHz will be used for this purpose under the same conditions.

448 The use of the bands 14–19.95 kHz, 20.05–70 kHz, and 70–90 kHz (72–84 kHz and 86–90 kHz in Region 1) by the maritime mobile service is limited to coast radiotelegraph stations (A1A and F1B only). Exceptionally, the use of class J2B or J7B emissions is authorized subject to the necessary bandwidth not exceeding that normally used for class A1A or F1B emissions in the band concerned.

449 *Additional allocation:* In Bulgaria, Hungary, Poland, the German Democratic Republic, Czechoslovakia, and the U.S.S.R., the band 67—70 kHz is also allocated to the radionavigation service on a permitted basis.

450 *Different category of service:* In Bangladesh, Iran and Pakistan the allocation of the bands 70—72 kHz and 84—86 kHz to the fixed and maritime mobile services is on a primary basis (see No. 425).

451 In the bands 70–90 kHz (70–86 kHz in Region 1) and 110–130 kHz (112–130 kHz in Region 1), pulsed radionavigation systems may be used on condition that they do not cause harmful interference to other services to which these bands are allocated.

452 In Region 2, the establishment and operation of stations in the maritime radionavigation service in the bands 70—90 kHz and 110—130 kHz shall be subject to agreement obtained under the procedure set forth in Article 14 with administrations whose services, operating in accordance with the Table, may be affected. However, stations of the fixed, maritime mobile and radiolocation services shall not cause harmful interference to stations in the maritime radionavigation service under such agreements.

453 Administrations which operate stations in the radionavigation service in the band 90—110 kHz are urged to coordinate technical and operating characteristics in such a way as to avoid harmful interference to the services provided by these stations.

453A In the band 90–110 kHz, the United Kingdom may continue to use its coast radiotelegraph stations in operation on 14 September 1987, on a secondary basis.

454 Only classes A1A or F1B, A2C, A3C, F1C or F3C emissions are authorized for stations of the fixed service in the bands allocated to this service between 90 kHz and 160 kHz (148.5 kHz in Region 1) and for stations of the maritime mobile service in the bands allocated to this service between 110 kHz and 160 khz (148.5 kHz in Region 1). Exceptionally, class J2B or J7B emissions are also authorized in the bands between 110 kHz and 160 kHz (148.5 kHz in Region 1) for stations of the maritime mobile service.

455 *Different category of service:* In Bangladesh, Iran and Pakistan, the allocation of the bands 112—117.6 kHz and 126—129 kHz to the fixed and maritime mobile services is on a primary basis (see No. 425).

456 *Different category of service:* In Federal Republic of Germany, the allocation of the band 115—117.6 kHz to the fixed and maritime mobile services is on a primary basis (see No. 425) and to the radionavigation service on a secondary basis (see No. 424).

457 *Additional allocation:* In Bulgaria, Hungary, Mongolia, Poland, the German Democratic Republic, Roumania, Czechoslovakia, and the U.S.S.R., the band 130—148.5 kHz is also allocated to the radionavigation service on a secondary basis. Within and between these countries this service shall have an equal right to operate.

459 In the Region 2 polar areas (north of 60° N and south of 60° S) which are subject to auroral disturbances, the aeronautical fixed service is the primary service in the band 160—190 kHz.

460 *Alternative allocation:* In Angola, Botswana, Burundi, the Congo, Malawi, Rwanda, South Africa and Zaire, the band 160—200 kHz is allocated to the fixed service on a primary basis.

461 *Additional allocation:* In Somalia, the band 200—255 kHz is also allocated to the aeronautical radionavigation service on a primary basis.

462 *Alternative allocation:* In Angola, Botswana, Burundi, Cameroon, Central African Republic, the Congo, Ethiopia, Kenya, Lesotho, Madagascar, Malawi, Mozambique, Namibia, Nigeria, Oman, Rwanda, South Africa, Swaziland, Tanzania, Chad, Zaire, Zambia and Zimbabwe, the band 200—283.5 kHz is allocated to the aeronautical radionavigation service on a primary basis.

463 *Different category of service:* In Sudan and Yemen (P.D.R. of), the allocation of the band 255—283.5 kHz to the aeronautical

radionavigation service is on a primary basis (see No. 425).

464 *Alternative allocation:* In Tunisia, the band 255—283.5 kHz is allocated to the broadcasting service on a primary basis.

464A In Region 1, the change of the band limit from 285 kHz to 283.5 kHz shall take place on 1 February 1990 (see Resolution 500).

465 Norwegian stations of the fixed service situated in northern areas (north of 60° N) subject to auroral disturbances are allowed to continue operation on four frequencies in the bands 283.5—490 kHz and 510—526.5 kHz.

466 In the band 285—325 kHz (283.5—325 kHz in Region 1), in the maritime radionavigation service, radiobeacon stations may also transmit supplementary navigational information using narrow-band techniques, on condition that the prime function of the beacon is not significantly degraded.

466A *Additional Allocation:* in Region 1, the frequency band 285.3–285.7 kHz is also allocated to the maritime radionavigation service (other than radiobeacons) on a permitted basis.

467 *Different category of service:* In the U.S.S.R., and the Black Sea areas of Bulgaria, Roumania and Turkey, the allocation of the band 315—325 kHz to the maritime radionavigation service is on a primary basis (see No. 425) under the following conditions:

(a) In the Black Sea and White Sea areas, the maritime radionavigation service is the primary service and the aeronautical radionavigation service is the permitted service;

(b) In the Baltic Sea area, the assignment of frequencies in this band to new stations in the maritime or aeronautical radionavigation services shall be subject to prior consultation between the administrations concerned.

468 The frequency 410 kHz is designated for radio direction-finding in the maritime radionavigation service. The other radionavigation services to which the band 405—415 kHz is allocated shall not cause harmful interference to radio direction-finding in the band 406.5—413.5 kHz.

469 *Different category of service:* in Afghanistan, Australia, China, the Overseas French Territories of Region 3, India, Indonesia, the Islamic Republic of Iran, Japan, Pakistan, Papua New Guinea and Sri Lanka, the allocation of the band 415–495 kHz to the aeronautical radionavigation service is on a permitted basis. Administrations in these countries shall take all practical steps necessary to ensure that aeronautical radionavigation stations in the band 435–495 kHz do not cause interference to reception by coast stations of ship stations transmitting on frequencies designated for ship stations on a world-wide basis (see No. 4237).

469A *Different category of service:* in Cuba, the United States of America, and Mexico the allocation of the band 415–435 kHz to the aeronautical radionavigation service is on a primary basis.

470 The use of the bands 415—495 kHz and 505—526.5 kHz (505—510 kHz in Region 2) by the maritime mobile service is limited to radiotelegraphy.

470A In Region 2, the use of the band 435–495 kHz by the aeronautical radionavigation service is limited to non-directional beacons not employing voice transmission.

471 The bands 490–495 kHz and 505–510 kHz shall be subject to the provision of No. 3018 until the entry into force of the reduced guardband in accordance with Resolution 210 (Mob–87).

472 The frequency 500 kHz is an international distress and calling frequency for Morse radiotelegraphy. The conditions for its use are prescribed in Articles 37, 38, N 38 and 60.

472A In the maritime mobile service, the frequency 490 kHz is, from the date of full implementation of the GMDSS (see Resolution 331 (Mob–87)), to be used exclusively for the transmission by coast stations of navigational and meteorological warnings and urgent information to ships, by means of narrow-band direct-printing telegraphy. The conditions for use of the frequency 490 kHz are prescribed in Articles N 38 and 60, and Resolution 329 (Mob–87). In using the band 415–495 kHz for the aeronautical radionavigation service, administrations are requested to ensure that no harmful interference is caused to the frequency 490 kHz.

474 The conditions for the use of frequency 518 kHz by the maritime mobile service are prescribed in Articles 38, N 38 and 60 (see Resolution 324 (Mob–87) and Article 14A).

475 In the band 515.5—526.5 kHz, Austria may continue to operate only those broadcasting stations listed in Additional Protocol III to the Final Acts of the Regional Administrative LF/MF Broadcasting Conference (Regions 1 and 3), Geneva, 1975. This operation is allowed until the entry into force of a revision of the Geneva Plan, 1975, and subject to not causing harmful interference to the maritime mobile and aeronautical radionavigation services.

476 *Additional allocation:* In the United Kingdom, the band 519.5—526.5 kHz is also allocated to the broadcasting service on a secondary basis for the transmission of public utility information.

477 In Region 2, in the band 525—535 kHz the carrier power of broadcasting stations shall not exceed 1 kilowatt during the day and 250 watts at night.

478 *Additional allocation:* In Angola, Botswana, Lesotho, Malawi, Mozambique, Namibia, South Africa, Swaziland, Zambia and Zimbabwe, the band 526.5—535 kHz is also allocated to the mobile service on a secondary basis.

479 *Additional allocation:* In China, the band 526.5—535 kHz also allocated to the

aeronautical radionavigation service on a secondary basis.

480 In Region 2, the use of the 1605–1705 kHz band by stations of the broadcasting service is subject to the Plan established by the Regional Administrative Radio Conference (Rio de Janeiro, 1988).

In Region 2, in the 1625–1705 kHz band, the relationship between the broadcasting, fixed and mobile services is shown in No. 419. However, the examination of frequency assignments to stations of the fixed and mobile services in the 1625–1705 kHz band under No. 1241 shall take account of the allotments appearing in the plan established by the Regional Administrative Radio Conference (Rio de Janeiro, 1988).

480A In the band 1605–1705 kHz, in cases where a broadcasting station of Region 2 is concerned, the service area of the maritime mobile stations in Region 1 shall be limited to that provided by ground-wave propagation.

481 In Region 2, until the dates decided by the regional administrative radio conference referred to in No. 480, the band 1 605—1 705 kHz is allocated to the fixed, mobile and aeronautical radionavigation services on a primary basis and to the radiolocation service on a secondary basis (see Recommendation 504).

482 *Additional allocation:* In Australia, Indonesia, New Zealand, the Philippines, Singapore, Sri Lanka and Thailand, the band 1 606.5—1 705 kHz is also allocated to the broadcasting service on a secondary basis.

483 *Different category of service:* In Bulgaria, Hungary, Mongolia, Nigeria, Poland, the German Democratic Republic, Chad, Czechoslovakia and the U.S.S.R., the allocation of the bands 1 606.5—1 625 kHz, 1 635–1 800 kHz and 2 107—2 160 kHz to the fixed and land mobile services is on a primary basis (see No. 425).

484 Some countries of Region 1 use radiodetermination systems in the bands 1 606.5—1 625 kHz, 1 635—1 800 kHz, 1 850—2 160 kHz, 2 194–2 300 kHz, 2 502—2 850 kHz and 3 500—3 800 kHz. The establishment and operation of such systems are subject to agreement obtained under the procedure set forth in Article 14. The radiated mean power of these stations shall not exceed 50 W.

485 *Additional allocation:* In Angola, Bulgaria, Hungary, Mongolia, Nigeria, Poland, the German Democratic Republic, Chad, Czechoslovakia and the U.S.S.R., the bands 1 625—1 635 kHz, 1 800—1 810 kHz and 2 160—2 170 kHz are also allocated to the fixed and land mobile services on a primary basis subject to agreement obtained under the procedure set forth in Article 14.

486 In Region 1, in the bands 1 625—1 635 kHz, 1 800—1 810 kHz and 2 160—2 170 kHz (except in the countries listed in No. 485 and those listed in No. 499 for the band 2 160—2 170 kHz), existing stations in the fixed and mobile except aeronautical mobile services (and stations of the aeronautical mobile (OR) service in the band 2 160—2 170 kHz) may continue to operate on a primary basis until satisfactory replacement assignments have been found and implemented in accordance with Resolution 38.

487 In Region 1, the establishment and operation of radiolocation stations in the bands 1 625—1 635 kHz, 1 800—1 810 kHz and 2 160—2 170 kHz shall be subject to agreement obtained under the procedure set forth in Article 14 (see also No. 486). The radiated mean power of radiolocation stations shall not exceed 50 W. Pulse systems are prohibited.

488 In the Federal Republic of Germany, Denmark, Finland, Hungary, Ireland, Israel, Jordan, Malta, Norway, Poland, the German Democratic Republic, the United Kingdom, Sweden, Czechoslovakia and the U.S.S.R., administrations may allocate up to 200 kHz to their amateur service in the band 1 715—1 800 kHz and 1 850—2 000 kHz. However, when allocating the bands within this range to their amateur service, administration shall, after prior consultation with administrations of neighbouring countries, take such steps as may be necessary to prevent harmful interference from their amateur service to the fixed and mobile services of other countries. The mean power of any amateur station shall not exceed 10 W.

489 In Region 3, the Loran system operates either on 1850 kHz or 1950 kHz, the bands occupied being 1825–1875 kHz and 1925–1975 kHz respectively. Other services to which the band 1800–2000 kHz is allocated may use any frequency therein on condition that no harmful interference is caused to the Loran system operating on 1850 kHz or 1950 kHz.

490 *Alternative allocation:* In the Federal Republic of Germany, Angola, Austria, Belgium, Bulgaria, Cameroon, the Congo, Denmark, Egypt, Spain, Ethiopia, France, Greece, Italy, Lebanon, Luxembourg, Malawi, the Netherlands, Portugal, Syria, the German Democratic Republic, Somalia, Tanzania, Tunisia, Turkey and the U.S.S.R., the band 1 810—1 830 kHz is allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis.

491 *Additional allocations:* In Saudi Arabia, Iraq, Israel, Libya, Poland, Roumania, Chad, Czechoslovakia, Togo and Yugoslavia, the band 1 810—1 830 kHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis.

492 In Region 1, the use of the band 1 810—1 850 kHz by the amateur service is subject to the condition that satisfactory replacement assignments have been found and implemented in accordance with Resolution 38, for frequencies to all existing stations of the fixed and mobile, except aeronautical mobile, services operating in this band (except for the stations of the countries listed in

Nos. 490, 491 and 493). On completion of satisfactory transfer, the authorization to use the band 1 810—1 830 kHz by the amateur service in countries situated totally or partially north of 40°N shall be given only after consultation with the countries mentioned in Nos. 490 and 491 to define the necessary steps to be taken to prevent harmful interference between amateur stations and stations of other services operating in accordance with Nos. 490 and 491.

493 *Alternative allocations:* In Burundi and Lesotho, the band 1 810—1 850 kHz is allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis.

494 *Alternative allocation:* In Argentina, Bolivia, Chile, Mexico, Paraguay, Peru, Uruguay and Venezuela, the band 1 850—2 000 kHz is allocated to the fixed, mobile except aeronautical mobile, radiolocation and radionavigation services on a primary basis.

495 In Region 1, in making assignments to stations in the fixed and mobile services in the bands 1 850—2 045 kHz, 2 194—2 498 kHz, 2 502—2 625 kHz and 2 650—2 850 kHz, administrations should bear in mind the special requirements of the maritime mobile service.

496 In Region 1, the use of the band 2 025—2 045 kHz by the meteorological aids service is limited to oceanographic buoy stations.

497 In Region 2, except in Greenland, coast stations and ship stations using radiotelegraphy in the band 2065–2107 kHz shall be limited to class R3E or J3E emission and to a peak envelope power not exceeding 1 kW. Preferably, the following carrier frequencies should be used: 2065.0 kHz, 2079.0 kHz, 2082.5 kHz, 2086.0 kHz, 2093.0 kHz, 2096.5 kHz, 2100.0 kHz, 2103.5 kHz. In Argentina, Brazil and Uruguay, the carrier frequencies 2068.5 kHz and 2075.5 kHz are also used for this purpose, while the frequencies within the band 2072–2075.5 kHz are used as provided in No. 4323 BD.

498 In Regions 2 and 3, provided no harmful interference is caused to the maritime mobile service, the frequencies between 2 065 kHz and 2 107 kHz may be used by stations of the fixed service com ## Saudi Arabia, Botswana, Ethiopia, Iraq, Lesotho, Libya, Malawi, Somalia, Swaziland and Zambia, the band 2 160—2 170 kHz is also allocated to the fixed and mobile, except aeronautical mobile (R), services on a primary basis. The mean power of stations in these services shall not exceed 50 W.

500 The carrier frequency 2182 kHz is an international distress and calling frequency for radiotelephony. The conditions for the use of the band 2173.5–2190.5 kHz are prescribed in Articles 37, 38, N 38, and 60.

500A The frequencies 2187.5 kHz, 4207.5 kHz, 6312 kHz, 8414.5 kHz, 12577 kHz, and 16804.5 kHz are international distress frequencies for digital selective calling. The conditions for the use of these frequencies are prescribed in Article N 38.

500B The frequencies 2174.5 kHz, 4177.5 kHz, 6268 kHz, 8376.5 kHz, 12520 kHz, and 16695 kHz are international distress frequencies for narrow-band direct-printing telegraphy. The conditions for the use of these frequencies are prescribed in Article N 38.

501 The carrier frequencies 2182 kHz, 3023 kHz, 5680 kHz, 8364 kHz and the frequencies 121.5 MHz, 156.8 MHz and 243 MHz may also be used, in accordance with the procedures in force for terrestrial radiocommunication services, for search and rescue operations concerning manned space vehicles. The conditions for the use of the frequencies are prescribed in Articles 38 and N 38. The same applies to the frequencies 10003 kHz, 14993 kHz and 19993 kHz, but in each of these cases emissions must be confined in a band of ± 3 kHz about the frequency.

502 *Alternative allocation:* In Belgium, Cyrus, Denmark, Spain, France, Greece, Iceland, Italy, Malta, Norway, the Netherlands, Portugal, the United Kingdom, Singapore, Sri Lanka, Sweden, Turkey and Yugoslavia, the band 2 194—2 300 kHz is allocated to the maritime mobile service on a primary basis and the fixed and land mobile services on a permitted basis.

503 For the conditions for the use of the band 2 300—2 495 kHz (2 498 kHz in Region 1), 3 200—3 400 kHz, 4 750—4 995 kHz and 5 005—5 060 kHz by the broadcasting service, see Nos. 406 to 410, 411 and 2666 to 2673.

504 *Alternative allocation:* In Belgium, Cyrus, Denmark, Spain, France, Greece, Iraq, Italy, Malta, Norway, the Netherlands, Portugal, the United Kingdom, Sweden, Turkey and Yugoslavia, the band 2 502—2 625 kHz is allocated to the maritime mobile service on a primary basis and to the fixed and land mobile services on a permitted basis.

505 The carrier (reference) frequencies 3023 kHz and 5680 kHz may also be used, in accordance with Articles 38 and N 38 by stations of the maritime mobile service engaged in coordinated search and rescue operations.

506 Administrations are urged to authorize the use of the band 3 155—3 195 kHz to provide a common world-wide channel for low power wireless hearing aids. Additional channels for these devices may be assigned by administrations in the bands between 3 155 kHz and 3 400 kHz to suit local needs.

It should be noted that the frequencies in the range 3 000 kHz to 4 000 kHz are suitable for hearing aid devices which are designed to operate over short distances within the induction field.

507 *Alternative allocation:* In Belgium, Cameroon, Cyprus, Ivory Coast, Denmark, Egypt, Spain, France, Greece, Iceland, Italy, Liberia, Malta, Norway, the Netherlands, the United Kingdom, Singapore, Sri Lanka, Sweden, Togo, Turkey and Yugoslavia, the band 3 155—3 200 kHz is allocated to the maritime mobile service on a primary basis and to the

fixed and land mobile services on a permitted basis.

508 *Additional allocation:* In Australia, Brazil, Canada, the United States, Japan, Mexico, New Zealand, Peru and Uruguay, the band 3 230—3 400 kHz is also allocated to the radiolocation service on a secondary basis.

509 *Additional allocation:* In Honduras, Mexico, Peru and Venezuela, the band 3 500—3 750 kHz is also allocated to the fixed and mobile services on a primary basis.

510 For the use of these bands allocated to the amateur service at 3.5 MHz, 7.0 MHz, 10.1 MHz, 14.0 MHz, 18.068 MHz, 21.0 MHz, 24.89 MHz and 144 MHz in the event of natural disasters, see Resolution 640.

511 *Additional allocation:* In Brazil, the band 3 700—4 000 kHz is also allocated to the radiolocation service on a primary basis.

512 *Alternative allocation:* In Argentina, Bolivia, Chile, Ecuador, Paraguay, Peru and Uruguay, the band 3 750—4 000 kHz is allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis.

513 *Alternative allocation:* In Botswana, Lesotho, Malawi, Mozambique, Namibia, South Africa, Swaziland, Zambia and Zimbabwe, the band 3 900—3 950 kHz is allocated to the broadcasting service on a primary basis. The use of this band by the broadcasting service is subject to agreement obtained under the procedure set forth in Article 14 with neighbouring countries having services operating in accordance with the Table.

514 *Additional allocation:* In Canada, the band 3 950—4 000 kHz is also allocated to the broadcasting service on a primary basis. The power of broadcasting stations operating in this band shall not exceed that necessary for a national service within the frontier of this country and shall not cause harmful interference to other services operating in accordance with the Table.

515 *Additional allocation:* In Greenland, the band 3 950—4 000 kHz is also allocated to the broadcasting service on a primary basis. The power of the broadcasting stations operating in this band shall not exceed that necessary for a national service and shall in no case exceed 5 kW.

516 In Region 3, the stations of those services to which the band 3 995—4 005 kHz is allocated may transmit standard frequency and time signals.

517 The use of the band 4000–4063 kHz by the maritime mobile service is limited to ship stations using radiotelephony (see No. 4374 and Appendix 16).

518 In Afghanistan, Argentina, Australia, Botswana, China, India, Swaziland, Chad and the U.S.S.R., in the bands 4 063—4 123 kHz, 4 130—4 133 kHz and 4 408—4 438 kHz, stations of limited power in the fixed service which are situated at least 600 km from the coast may operate on condition that harmful interference is not caused to the maritime mobile service.

519 On condition that harmful interference is not caused to the maritime mobile service, the frequencies in the bands 4 063—4 123 kHz and 4 130—4 438 kHz may be used exceptionally by stations in the fixed service communicating only within the boundary of the country in which they are located with a mean power not exceeding 50 W.

520 The conditions for the use of the carrier frequencies 4125 kHz and 6215 kHz are prescribed in Articles 37, 38, N 38 and 60.

520A The frequency 4209.5 kHz is used exclusively for the transmission by coast stations of meteorological and navigational warnings and urgent information to ships by means of narrow-band direct-printing techniques (see Resolution 332 (Mob–87)).

520B The frequencies 4210 kHz, 6314 kHz, 8416.5 kHz, 12579 kHz, 16806.5 kHz, 19680.5 kHz, 22376 kHz, and 26100.5 kHz are the international frequencies for the transmission of Maritime Safety Information (MSI) (see Resolution 333 (Mob–87) and Appendix 31).

521 *Different category of service:* In the U.S.S.R., the allocation of band 5 130—5 250 kHz to the mobile, except aeronautical mobile, service is on a primary basis (see No. 425).

522 On condition that harmful interference is not caused to the maritime mobile service, the bands 6 200—6 213.5 kHz and 6 220.5—6 525 kHz may be used exceptionally by stations in the fixed service, communicating only within the boundary of the country in which they are located, with a mean power not exceeding 50 W. At the time of notification of these frequencies, the attention of the International Frequency Registration Board will be drawn to the above conditions.

523 [Reserved]

524 The band 6 765—6 795 kHz (centre frequency 6 780 kHz) is designated 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.

525 *Different category of service:* In Mongolia and the U.S.S.R., the allocation of the band 6 765—7 000 kHz to the land mobile service is on a primary basis.

526 *Additional allocation:* In Angola, Iraq, Kenya, Rwanda, Somalia and Togo, the band 7 000—7 050 kHz is also allocated to the fixed service on a primary basis.

527 *Alternative allocation:* In Egypt, Ethiopia, Guinea, Libya, Madagascar, Malawi and Tanzania, the band 7 000—7 050 kHz is allocated to the fixed service on a primary basis.

528 The use of the band 7 100—7 300 kHz in Region 2 by the amateur service shall not

impose constraints on the broadcasting service intended for use within Region 1 and Region 3.

529 In Region 3, the stations of those services to which the band 7 995—8 005 kHz is allocated may transmit standard frequency and time signals.

529A The conditions for the use of the carrier frequency 8291 kHz, 12290 kHz, and 16420 kHz, are prescribed in Articles 38, N 38 and 60.

530 On condition that harmful interference is not caused to the broadcasting service, frequencies in the bands 9 775—9 900 kHz, 11 650—11 700 kHz and 11 975—12 050 kHz may be used by stations in the fixed service communicating only within the boundary of the country in which they are located, each station not using a total radiated power exceeding 24 dBW.

531 The bands 9 775—9 900 kHz, 11 650—11 700 kHz, 11 975—12 050 kHz, 13 600—13 800 kHz, 15 450—15 600 kHz, 17 550—17 700 kHz and 21 750—21 850 kHz are allocated to the fixed service on a primary basis subject to the procedure described in Resolution 8. The use of these bands by the broadcasting service shall be 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). Within these bands, the date of commencement of operations in the broadcasting service on a planned channel shall not be earlier than the date of completion of satisfactory transfer, according to the procedures described in Resolution 8, of all assignments to stations in the fixed service operating in accordance with the Table and other provisions of the Radio Regulations, which are recorded in the Master Register and which may be affected by broadcasting operations on that channel.

532 The bands 12 230—12 330 kHz, 16 360—16 460 kHz, 17 360—17 410 kHz, 18 780—18 900 kHz, 19 680—19 800 kHz and 22 720—22 kHz are allocated to the fixed service on a primary basis subject to the procedure described in Resolution 8. The use of these bands by the maritime mobile service shall be subject to provisions to be decided by a competent world administrative radio conference. The date of commencement of operations in the maritime mobile service on a frequency in accordance with the above-mentioned provisions shall not be earlier than the date of completion of satisfactory transfer, in accordance with the procedure described in Resolution 8, of all assignments to stations in the fixed service operating in accordance with the Table and other provisions of the Radio Regulations which are recorded in the Master Register and which may be affected by maritime mobile operations on that frequency.

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).

534 The band 13 553—13 567 kHz (centre frequency 13 560 kHz) is designed for industrial, scientific and medical (ISM) applications. Radiocommunication services operating within this band must accept harmful interference which may be caused by these applications. ISM equipment operating in this band is subject to the provisions of No. 1815.

535 *Additional allocation:* In Afghanistan, China, the Ivory Coast, Iran and the U.S.S.R., the band 14 250—14 350 kHz is also allocated to the fixed service on a primary basis. Stations of the fixed services shall not use a radiated power exceeding 24 dBW.

536 In Region 3, the stations of those services to which the band 15 995—16 005 kHz is allocated may transmit standard frequency and time signals.

537 The band 18 068—18 168 kHz is allocated to the fixed service on primary basis subject to the procedure described in Resolution 8. The use of this band by the amateur and amateur-satellite service shall be subject to the completion of satisfactory transfer of all assignments to stations in the fixed service operating in this band and recorded in the Master Register, in accordance with the procedure described in Resolution 8.

538 *Additional allocation:* In the U.S.S.R., the band 18 068—18 168 kHz is also allocated to the fixed service on a primary basis for use within the boundary of the U.S.S.R., with a peak envelope power not exceeding 1 kW.

539 *Alternative allocation:* In Bulgaria, Hungary, Mongolia, Poland, Czechoslovakia and the U.S.S.R., the band 21 850—21 870 kHz is allocated to the aeronautical fixed and the aeronautical mobile (R) services on a primary basis.

540 *Additional allocation:* In Nigeria, the band 22 720—23 200 kHz is also allocated to the meteorological aids service (radiosondes) on a primary basis.

541 The use of the band 23 350—24 000 kHz by the maritime mobile service is limited to inter-ship radiotelegraphy.

542 *Additional allocation:* In Kenya, the band 23 600—24 900 kHz is also allocated to the meteorological aids service (radiosondes) on a primary basis.

543 The band 24 890—24 900 kHz is allocated to the fixed and land mobile services on a primary basis subject to the procedure described in Resolution 8. The use of this band by the amateur and amateur-satellite services shall be subject to the completion of the satisfactory transfer of all assignments to fixed and land mobile stations operating

in this band and recorded in the Master Register, in accordance with the procedure described in Resolution 8.

544 The bands 25 110—25 210 kHz and 26 100—26 175 kHz are also allocated to the fixed and land mobile services on a primary basis subject to the procedure described in Resolution 8. The use of these bands on an exclusive basis by the maritime mobile service shall be subject to provisions to be decided by a competent world administrative radio conference. The date of commencement of operations in maritime mobile service on a frequency in accordance with the above-mentioned provisions shall not be earlier than the date of completion of satisfactory transfer, in accordance with the procedure described in Resolution 8, of all assignments to stations in the fixed and land mobile services operating in accordance with the Table and other provisions of the Radio Regulations recorded in the Master Register and which may be affected by such maritime mobile operations on that frequency.

545 The band 25 500—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 the 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 kHz shall be avoided. The use of passive sensors by other services will also be authorized.

546 The band 26 957—27 283 kHz (center frequency 27 120 kHz) is designated for industrial, scientific and medical (ISM) applications. Radiocommunication service operating within this band must accept harmful interference which may be caused by these applications. ISM equipment operating in this band is subject to the provisions of No. 1815.

547 In making assignments to stations of other services to which the band 37.5—38.25 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).

548 The band 40.66—40.70 MHz (centre frequency 40.68 MHz) is designated for industrial, scientific and medical (ISM) applications. Radiocommunication services operating within this band must accept harmful interference which may be caused by these applications. ISM equipment operating in this band is subject to the provisions of No. 1815.

549 *Additional allocation:* In Botswana, Burundi, Lesotho, Malawi, Namibia, Rwanda, South Africa, Swaziland, Zaire, Zambia and Zimbabwe and band 41—44 MHz is also allocated to the aeronautial radionavigation service on a primary basis.

550 *Additional allocation:* In Iran and Japan, the band 41—44 MHz is also allocated to the radiolocation service on a secondary basis.

552 *Additional allocation:* In Australia and New Zealand, the band 44—47 MHz is also allocated to the broadcasting service on a primary basis.

553 *Additional allocation:* In Hungary, Kenya, Mongolia, Czechoslovakia and the U.S.S.R., the bands 47—48.5 and 56.5—58 MHz are also allocated to the fixed and land mobile services on a secondary basis.

554 *Additional allocation:* in Albania, the Federal Republic of Germany, Austria, Belgium, Bulgaria, Cote d'Ivoire, Denmark, Spain, Finland, France, Gabon, Greece, Ireland, Israel, Italy, Jordan, Lebanon, Lybia, Liechtenstein, Luxembourg, Madagascar, Mali, Malta, Morocco, Mauritania, Monaco, Nigeria, Norway, the Netherlands, Poland, the German Democratic Republic, the United Kingdom, Senegal, Sweden, Switzerland, Swaziland, Syria, Togo, Tunisia, Turkey and Yugoslavia, the band 47–68 MHz and in Romania, the band 47–58 MHz, are also allocated to the land mobile service on a permitted basis. However, stations of the land mobile service in the countries mentioned in connection with each band referred to in this footnote shall not cause harmful interference to, or claim protection from, existing or planned broadcasting stations of countries other than those mentioned in connection with the band.

555 *Additional allocation:* Il Angola, Cameroon, Congo, Nadagascar, Mozambique, Somalia, Sudan, Tanzania, Chad and Yemen (P.D.R.), the band 47—68 MHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a permitted basis.

556 Alternative allocation: In Neu Zealand, the band 50—51 MHz is allmcated to the fixed, mobile and broadcasting services on a primary basis; the band 53—54 MHz is allocated to the fixed and mobile services on a primary basis.

557 Alternative allocation: In Afghanistan, Bangladesh, Brunei, India, Indonesia, Iran, Malaysia, Pakistan, Singapore and Thailand, the band 50—54 MHz is allocated to the fixed, mobile and broadcasting services on a primary basis.

558 *Additional allocation:* In Australia, China and the Democratic People%s Republic of Korea, the band 50]54 MHz is also allocated to the broadcasting service on a primary basis.

559 *Additional allocation:* In Botswana, Burundi, Lesotho, Malawi, Namibia, Rwanda, South Africa, Swaziland, Zaire, Zambia and Zimbabwe, the band 50—54 MHz is also allocated to the amateur service on a primary basis.

560 *Additional allocation:* In New Zealand, the band 51—53 MHz is also allocated to the fixed and mobile services on a primary basis.

561 *Additional allocation:* In Botswana, Burundi, Lesotho, Malawi, Mali, Namibia, Rwanda, South Africa, Swaziland, Zaire, Zambia and Zimbabwe, the band 54—68 MHz is allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis.

562 Different category of service: In the French Overseas Departments in Region 2, Guyana, Jamaica and Mexico, the allocation of the band 54—68 MHz to the fixed and mobile services is on a primary basis (see No. 425).

563 Different category of service: In Cuba, the French Overseas Departments in Region 2, Guyana, Jamaica and Mexico, the allocation of the band 68—72 MHz to the fixed and mobile services is on a primary basis (see No. 425).

564 *Additional allocation:* In Bulgaria, Hungary, Poland, Roumania and Czechoslovakia, the band 68—73 MHz is allocated to the broadcasting service on a primary basis and used in accordance with the decisions in the Final Acts of the Special Regional Conference, Geneva, 1960.

565 *Additional allocation:* In Mongolia and the U.S.S.R., the bands 68—73 MHz and 76—87.5 MHz are allocated to the broadcasting service on a primary bais. The services to which these bands are allocated in other countries and the broadcasting service in Mongolia and the U.S.S.R., are subject to agreements with the neighboring countries concerned.

566 *Additional allocation:* In Australia, China, the Republic of Korea, the Philippines, the Democratic People's Republic of Korea and Western Samoa, the band 68—74 MHz is also allocated to the broadcasting service on a primary basis.

567 *Additional allocation:* In Bulgaria, Hungary, Mongolia, Poland, Czechoslovakia and the U.S.S.R., the band 73—74 MHz is also allocated to the broadcasting service on a primary basis. The use of this band by the broadcasting service in Bulgaria, Hungary, Mongolia, Poland, Czechoslovakia and the U.S.S.R., is subject to agreement obtained under the procedure set forth in Article 14.

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).

569 In Region 2, the fixed, mobile and broadcasting services previously authorized in the band 73—74.6 MHz may continue to operate on a non-interference basis to the radio astronomy service until 31 December 1985.

570 *Additional allocation:* In Columbia, Costa Rica, Cuba, El Salvador, Ecuador, Guatemala, Guyana, Honduras and Nicaragua, the band 73—74.6 MHz is also allocated to the fixed and mobile services on a secondary basis.

571 *Additional allocation:* In Bulgaria, China, Hungary, Mongolia, Poland, Czechoslovakia and the U.S.S.R., the bands 74.6—74.8 and 75.2—75.4 MHz are also allocated to the aeronautical radionavigation service, on a primary basis, for ground-based transmitters only.

572 *Additional allocation:* The frequency 75 MHz is assigned to aeronautical marker beacons. Administrations shall refrain from assigning frequencies close to the limits of the guardband to stations of other services which, because of their power or geographical position, might cause harmful interference or otherwise place a constraint on marker beacons.

Until 31 December 1989, administrations in Regions 2 and 3 should refrain from assigning frequencies to other services in the bands 74.6—74.8 MHz and 75.2—75.4 MHz.

In the future every effort should be made to improve further the characteristics of airborne receivers and to limit the power of transmitting stations close to the limits 74.8 and 75.2 MHz.

572A *Additional allocation:* in Afghanistan, the Federal Republic of Germany, Austria, Belgium, Cyprus, Denmark, Egypt, Spain, France, Greece, Israel, Italy, Japan, Jordan, Lebanon, Malta, Morocco, Monaco, Norway, the Netherlands, Portugal, the United Kingdom, Sweden, Switzerland, Syria and Turkey, the band 74.8–75.2 MHz is also allocated to the mobile service on a secondary basis subject to agreement obtained under the procedure set forth in Article 14. In order to ensure that harmful interference is not caused to stations of the aeronautical radionavigation service, stations of the mobile service shall not be introduced in the band until it is no longer required for the aeronautical radionavigation service by any administration which may be identified in the application of Article 14.

573 *Additional allocation:* In Western Samoa, the band 75.4—87 MHz is also allocated to the broadcasting service on a primary basis.

574 *Additional allocation:* In China, the Republic of Korea, Japan, the Philippines and

the Democratic People's Republic of Korea, the band 76—87 MHz is also allocated to the broadcasting service on a primary basis.

575 *Additional allocation:* In Bulgaria, Hungary, Poland, Roumania and Czechoslovakia, the band 76—87.5 MHz is also allocated to the broadcasting service on a primary basis and used in accordance with the decisions contained in the Final Acts of the Special Regional Conference, Geneva, 1960.

576 *Different category of service:* In the United States, the French Overseas Departments in Region 2, Guyana, Jamaica, Mexico and Paraguay the allocation of the band 76—88 MHz to the fixed and mobile services is on a primary basis (see No. 425).

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).

578 *Alternative allocation:* In Albania, the band 81—87.5 MHz is allocated to the broadcasting service on a primary basis and used in accordance with the decisions contained in the Final Acts of the Special Regional Conference, Geneva, 1960.

579 *Additional allocation:* In Afghanistan and Australia the band 85—87 MHz is also allocated to the broadcasting service on a primary basis. The introduction of the broadcasting service in these countries is subject to special agreements between the administrations concerned.

580 *Additional allocation:* In New Zealand, the band 87—88 MHz is allocated to the land mobile service on a primary basis.

581 *Additional allocation:* In the Federal Republic of Germany, Spain, France, Ireland, Italy, Liechtenstein, Monaco, the United Kingdom, Switzerland and Yemen (P.D.R. of), the band 87.5—88 MHz is also allocated to the land mobile service on a permitted basis and subject to agreement obtained under the procedure set forth in Article 14.

582 *Additional allocation:* In the United Kingdom the band 97.6—102.1 MHz is also allocated to the land mobile service on a permitted basis until 31 December 1989. The use of this band by the land mobile service is restricted to those stations in operation on 1 January 1980. The withdrawal of land mobile stations will be arranged in consultation with the administrations concerned.

584 Broadcasting stations in the band 100—108 MHz in Region 1 shall be established and operated in accordance with an agreement and associated plan for the band 87.5—108 MHz to be drawn up by a regional broadcasting conference (see Resolution 510). Prior to the date of entry into force of this agreement, broadcasting stations may be introduced subject to agreement between administrations concerned, on the understanding that such an operation shall in no case prejudice the establishment of the plan.

585 *Additional allocation:* In China, the Republic of Korea, the Philippines and Singapore, the band 100—108 MHz is also allocated to the fixed and mobile services on a permitted basis.

586 *Alternative allocation:* In New Zealand the band 100—108 MHz is allocated to the land mobile service on a primary basis and to the broadcasting service on a secondary basis.

587 *Additional allocation:* in Austria, Bulgaria, Hungary, Israel, Kenya, Mongolia, Poland, Syria, the German Democratic Republic, the United Kingdom, Somalia, Czechoslovakia, Turkey and the USSR, the band 104–108 MHz is also allocated to the mobile, except aeronautical mobile (R), service on a permitted basis until 31 December 1995 and, thereafter, on a secondary basis.

588 *Additional allocation:* In Finland and Yugoslavia, the band 104—108 MHz is also allocated to the fixed service on a permitted basis, until 31 December 1995. The effective radiated power of any station shall not exceed 25 W.

589 *Additional allocation:* in France, Romania, Sweden and Yugoslavia, the band 104–108 MHz is also allocated to the mobile, except aeronautical mobile (R), service on a permitted basis until 31 December 1995.

590A *Additional allocation:* in Afghanistan, the Federal Republic of German, Austria, Cyprus, Denmark, Egypt, Spain, France, Israel, Italy, Japan, Jordan, Lebanon, Malta, Morocco, Monaco, Norway, Pakistan, Portugal, the United Kingdom, Sweden, Switzerland, Syria and Turkey, the band 108–111.975 MHz is also allocated to the mobile service on a secondary basis subject to agreement obtained under the procedure set forth in Article 14. In order to ensure that harmful interference is not caused to stations of the aeronautical radionavigation service, stations of the mobile service shall not be introduced in the band until it is no longer required for the aeronautical radionavigation service by any administrations which may be identified in the application of Article 14.

591 Subject to agreement obtained under the procedure set forth in article 14, the band 117.975—137 MHz is also allocated to the aeronautical mobile-satellite (R) service on a secondary basis and on the condition that harmful interference is not caused to the aeronautical mobile (R) service.

592 The bands 121.45—121.55 MHz and 242.95—243.05 MHz are also allocated to the mobile-satellite service for the receptio on board satellites of emissions from emergency

position-indicating radiobeacons transmitting at 121.5 MHz and 243 MHz.

593 In the band 117.975–136 MHz, the frequency 121.5 MHz is the aeronautical emergency frequency and, where required, the frequency 123.1 MHz is the aeronautical frequency auxiliary to 121.5 MHz. Mobile stations of the maritime mobile service may communicate on these frequencies under the conditions laid down in Articles 38 and N 38 for distress and safety purposes with stations of the aeronautical mobile service.

594 *Additional allocation:* In Angola, Bulgaria, Hungary, Iran, Iraq, Japan, Mongolia, Mozambique, Papua New Guinea, Poland, the German Democratic Republic, Roumania, Czechoslovakia and the U.S.S.R., the band 132—136 MHz is also alocated to the aeronautical mobile (RO) service on a permitted basis.

594A *Different category of service:* as from 1 January 1990, in Bulgaria, Poland, German Democratic Republic, Romania, Czechoslovakia, Turkey and the USSR, the allocation of the band 136–137 MHz to the aeronautical mobile (OR) service is on a permitted basis.

595 Until 1 January 1990, the band 136–137 MHz is also allocated to the space operation service (space-to-Earth), meterological-satellite service (space-to-Earth) and the space research service (space-to-Earth) on a primary basis. The introduction of stations of the aeronautical mobile (R) service shall only occur after that date. After 1 January 1990, the band 136–137 MHz will also be allocated to the above-mentioned space radiocommunication services on a secondary basis (see Resolution 408 (Mob–87).

596 *Different category of service:* In Afghanistan, Saudi Arabia, Bahrain, Brunei, China, the United Arab Emirates, India, Indonesia, Iran, Iraq, Kuwait, Malaysia, Oman, Pakistan, Qatar, Singapore, Thailand, Yemen A.R. and Yemen (P.D.R. of), the allocation of the band 137—138 MHz to the fixed and mobile, except aeronautical mobile (R), services is on a primary basis (see No. 425).

597 *Different category of service:* In Israel, Jordan and Syria, the allocation of the band 137—138 MHz to the fixed and mobile, except aeronautical mobile, services is on a primary basis (see No. 425).

598 *Different category of service:* In Austria, Bulgaria, Egypt, Finland, Greece, Hungary, Lebanon, Mongolia, Poland, the German Democratic Republic, Roumania, Czechoslovakia, the U.S.S.R. and Yugoslavia, the allocation of the band 137—138 MHz to the aeronautical mobile (OR) service is on a primary basis.

599 *Additional allocation:* In Australia, the band 137—144 MHz is also allocated to the broadcasting service on a primary basis until that service can be accommodated within regional broadcasting allocations.

599A The use of the band 137–138 MHz by the mobile-satellite service is subject to the application of the coordination and notification procedures set forth in Resolution RES46 (WARC–92). However, coordination of a space station of the mobile-satellite service with respect to terrestrial services is required only if the power flux-density produced by the station exceeds −125 dB(W/m^2/4 kHz) at the Earth's surface. The above power flux-density limit shall apply until such time as a competent world administrative radio conference revises it. In making assignments to the space stations in the mobile-satellite service in the above band, administrations shall take all practicable steps to protect the radio astronomy service in the 150.05–153 MHz band from harmful interference from unwanted emissions.

599B The use of the bands 137–138 MHz, 148–149.9 MHz and 400.15–401 MHz by the mobile-satellite service and the band 149.9–150.05 MHz by the land mobile-satellite service is limited to non-geostationary-satellite systems.

600 *Additional allocation:* In the Federal Republic of Germany, Austria, Belgium, France, Israel, Italy, Liechtenstein, Luxembourg, the United Kingdom, Sweden, Switzerland and Czechoslovakia, the bands 138—143.6 MHz and 143.65—144 MHz are also allocated to the space research service (space-to-Earth) on a secondary basis.

601 *Additional allocation:* In the Federal Republic of Germany, Saudi Arabia, Austria, Bahrain, Belgium, Denmark, the United Arab Emirates, Spain, Finland, Greece, Ireland, Israel, Kenya, Kuwait, Liechtenstein, Luxembourg, Mali, Malta, Norway, the Netherlands, Qatar, the United Kingdom, Sweden, Switzerland, Somalia, Tanzania, Tunisia, Turkey and Yugoslavia, the band 138—144 MHz is also allocated to the maritime mobile and land mobile services on a primary basis.

602 *Alternative allocation:* In Angola, Botswana, Burundi, Cameroon, the Central African Republic, the Congo, Gabon, Gambia, Ghana, Guinea, Iraq, Jordan, Lesotho, Liberia, Libya, Malawi, Mozambique, Namibia, Nigeria, Oman, Rwanda, Sierra Leone, South Africa, Swaziland, Chad, Togo, Zaire, Zambia and Zimbabwe, the band 138—144 MHz is allocated to the fixed and mobile services on a primary basis.

603 *Additional allocation:* In China, the band 138—144 MHz is also allocated to the radiolocation service on a primary basis.

604 *Additional allocation:* In Ethiopia, Finland, Kenya, Malta, Somalia, Sudan, Tanzania, Yemen A.R. and Yugoslavia, the band 138—144 MHz is also allocated to the fixed service on a primary basis.

605 *Additional allocation:* In Singapore, the band 144—145 MHz is also allocated to the fixed and mobile services on a primary basis. Such use is limited to systems in operation

on or before 1 January 1980, which in any case shall cease by 31 December 1995.

606 *Additional allocation:* In China, the band 144—146 MHz is also allocated to the aeronautical mobile (OR) service on a secondary basis.

607 *Alternative allocation:* In Afghanistan, Bangladesh, Cuba, Guyana and India, the band 146—148 MHz is allocated to the fixed and mobile services on a primary basis.

608 Subject to agreement obtained under the procedure set forth in Article 14, the band 148—149.9 MHz may be used by the space operation service (Earth-to-space). The bandwidth of an individual transmission shall not exceed ±25 kHz.

608A The use of the band 148–149.9 MHz by the mobile-satellite service is subject to the application of the coordination and notification procedures set forth in Resolution RES46 (WARC–92). The mobile-satellite service shall not constrain the development and use of fixed, mobile and space operation services in the band 148–149.9 MHz. Mobile earth stations in the mobile-satellite service shall not produce a power flux-density in excess of −150 dB(W/m²/4 kHz) outside national boundaries.

608B The use of the band 149.9–150.05 MHz by the land mobile-satellite service is subject to the application of the coordination and notification procedures set forth in Resolution RES46 (WARC–92). The land mobile-satellite service shall not constrain the development and use of the radionavigation-satellite service in the band 149.9–150.05 MHz. Land mobile earth stations of the land mobile-satellite service shall not produce power flux-density in excess of −150 dB(W/m²/4kHz) outside national boundaries.

608C Stations of the mobile-satellite service in the band 148–149.9 MHz shall not cause harmful interference to, or claim protection from stations of the fixed or mobile services in the following countries: Algeria, the Federal Republic of Germany, Saudi Arabia, Australia, Austria, Bangladesh, Belarus, Belgium, Brunei Darussalam, Bulgaria, Cameroon, Canada, Cyprus, Colombia, Congo, Cuba, Denmark, Egypt, the United Arab Emirates, Ecuador, Spain, Ethiopia, the Russian Federation, Finland, France, Ghana, Greece, Honduras, Hungary, Iran, Ireland, Iceland, Israel, Italy, Japan, Jordan, Kenya, Libya, Liechtenstein, Luxembourg, Malaysia, Mali, Malta, Mauritania, Mozambique, Namibia, Norway, New Zealand, Oman, Pakistan, Panama, Papua New Guinea, the Netherlands, Phillippines, Poland, Portugal, Qatar, Syria, Romania, the United Kingdom, Singapore, Sri Lanka, Sweden, Switzerland, Suriname, Swaziland, Tanzania, Chad, the Czech and Slovak Federal Republic, Thailand, Tunisia, Turkey, Ukraine, Yemen and Yugoslavia that operate in accordance with the Table of Frequency Allocations.

609 Emissions of the radionaviagation-satellite service in the bands 149.9—150.05 MHz and 399.9—400.05 MHz may also be used by receiving earth stations of the space research service.

609A Recognizing that the use of the band 149.9–150.05 MHz by the fixed and mobile services may cause harmful interference to the radionavigation-satellite service, administrations are urged not to authorize such use in application No. 342.

609B In the band 149.9–150.05MHz, the allocation to the land mobile-satellite service shall be on a secondary basis until 1 January 1997.

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.

613 The frequency 156.8 MHz is the international distress, safety and calling frequency for the maritime mobile VHF radiotelephone service. The conditions for the use of this frequency are contained in Articles 38 and N 38.

In the bands 156–156.7625 MHz, 156.8375–157.45 MHz, 160.6–160.975 MHz and 161.475–162.05 MHz, each administration shall give priority to the maritime mobile service on only such frequencies as are assigned to stations of the maritime mobile service by the administration (see Articles 38, N 38 and 60).

Any use of frequencies in these bands by station of other services to which they are allocated should be avoided in areas where such use might cause harmful interference to the maritime mobile VHF radiocommunication service.

However, the frequency 156.8 MHz and the frequency bands in which priority is given to the maritime mobile service may be used for radiocommunications on inland waterways subject to agreement between interested and affected administrations and taking into account current frequency usage and existing agreements.

613A In the maritime mobile VHF service the frequency 156.525 MHz is to be used exclusively for digital selective calling for distress, safety and calling (see Resolution 323 (Mob–87)). The conditions for the use of this frequency are prescribed in Articles 38, N 38 and 60 and in Appendix 18.

613B *Additional allocation:* in Ireland and in the United Kingdom, the band 161.3875–161.4125 MHz is also allocated to the maritime radionavigation service on a primary

basis, subject to agreement obtained under the procedure set forth in Article 14.

615 *Alternative allocation:* In Morocco, the band 162—174 MHz is allocated to the broadcasting service on a primary basis. The use of this band shall be subject to agreement with administrations having services, operating or planned, in accordance with the Table which are likely to be affected. Stations in existence on 1 January 1981, with their technical characteristics as of that date, are not affected by such agreement.

616 *Additional allocation:* In China, the band 163—167 MHz is also allocated to the space operation service (space-to-Earth) on a primary basis subject to agreement obtained under the procedure set forth in Article 14.

617 *Additional allocation:* In Afghanistan, China and Pakistan, the band 167—174 MHz is also allocated to the broadcasting service on a primary basis. The introduction of the broadcasting service into this band shall be subject tm agreement with the neighbouring countries in Region 3, whose services are likely to be affected.

618 *Additional allocation:* In Japan, the band 170—174 MHz is also allmcated to the broadcasting service on a primary basis.

619 *Additional allocation:* In China, the band 174—184 MHz is also allocated to the space research (space-to-Earth) and the space operation (space-to-Earth) services on a primary basis subject to agreement obtained under the procedure set forth in Article 14. These services shall not cause harmful interference to, or claim protection from, existing or planned broadcasting stations.

620 *Different category of service:* In Mexico, the allocation of the band 174—216 MHz to the fixed and mobile services is on a primary basis (see No. 425).

621 *Additional allocation:* in the Federal Republic of Germany, Austria, Belgium, Denmark, Spain, Finland, France, Israel, Italy, Liechtenstein, Malta, Monaco, Norway, the Netherlands, the United Kingdom, Sweden, and Switzerland, the band 174–223 MHz is also allocated to the land mobile service on a permitted basis. However, the stations of the land mobile service shall not cause harmful interference to, or claim protection from, broadcasting stations, existing or planned, in countries other than those listed in this footnote.

622 *Different category of service:* in the Federal Republic of Germany, Austria, Belgium, Denmark, Spain, Finland, France, Israel, Italy, Liechtenstein, Luxembourg, Malta, Monaco, Norway, the Netherlands, Portugal, the United Kingdom, Sweden and Switzerland, the band 223–230 MHz is allocated to the land mobile service on a permitted basis (see No. 425). However, the stations of the land mobile service shall not cause harmful interference to, or claim protection from, broadcasting stations, existing or planned, in countries other than those listed in this footnote.

623 *Additional allocation:* In Congo, Ethiopia, Gambia, Guinea, Kenya, Libya, Malawi, Mali, Uganda, Senegal, Sierra Leone, Somalia, Tanzania, and Zimbabwe, the band 174—223 MHz is also allocated to the fixed and mobile services on a secondary basis.

624 *Additional allocation:* In Bangladesh, India, Pakistan, and the Philippines, the band 200—216 MHz is also allocated to the aeronautical radionavigation service on a primary basis.

625 *Additional allocation:* In Australia and Papuaa New Guinea, the bands 204—208 MHz and 222—223 MHz are also allocated to the aeronautical radionavigation service on a primary basis.

626 *Additional allocation:* In China, India and Thailand, the band 216—223 MHz is also allocated to the aeronautical radionavigation service on a primary basis and to the radiolocation service on a secondary basis.

627 In Region 2, no new stations in the radiolocation service may be authorized in the band 216–225 MHz. Stations authorized prior to 1 January 1990 may continue to operate on a secondary basis.

627A *Additional allocation:* in Canada, the band 216–220 MHz is also allocated to the land mobile service on a primary basis.

628 *Additional allocation:* In Somalia, the band 216—225 MHz is also allocated to the aeronautical radionavigation service on a primary basis, subject to not causing interference to existing or planned broadcating services in other countries.

629 *Additional allocation:* In Oman, the United Kingdom and Turkey, the band 216—235 MHz is also allocated to the radiolocation service on a secondary basis.

630 *Additional allocation:* In Japan, the band 222—223 MHz is also allocated to the aeronautical radionavigation service on a primary basis and to the radiolocation service on a secondary basis.

631 *Different category of service:* In Spain and Portugal, the band 223—230 MHz is allocated to the fixed service on a permitted basis (see No. 425). Stations of this service shall not cause harmful interference to, or claim protection from, broadcasting stations of other countries, whether existing or planned, that operate in accordance with the Table.

632 *Additional allocation:* In Saudi Arabia, Bahrain, the United Arab Emirates, Israel, Jordan, Oman, Qatar and Syria, the band 223—235 MHz is also allocated to the aeronatutical radionavigation service on a permited basis.

635 *Alternative allocation:* in Botswana, Lesotho, Malawi, Mozambique, Namibia, South Africa, Swaziland, Zambia and Zimbabwe, the bands 223–238 MHz and 246–254 MHz are allocated to the broadcasting service on a

primary basis, subject to agreement obtained under the provisions set forth in Article 14.

636 *Alternative allocation:* In New Zealand, Western Samoa, Niue and Cook Islands, the band 225—230 MHz is allocated to the fixed, mobile and aeronautical radionavigation services 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.

638 *Additional allocation:* In Nigeria, the band 230—235 MHz is also allocated to the aeronautical radionavigation service on a primary basis, subject to agreement obtained under the procedure set forth in Article 14.

639 *Additional allocation:* In Yugoslavia, the band 230—235 MHz is also allocated to the aeronautical radionavigation service on a primary basis, until 1 January 1995. The use of this band by the aeronautical radionavigation service in Yngoslavia is restricted to the stations in operation by 1 January 1980.

640 *Additional allocation:* In New Zealand, the band 235—239.5 MHz is also allocated to the aeronautical radionavigation service on a primary basis.

641 Subject to agreement obtained under the procedure set forth in Article 14, the bands 235—322 MHz and 335.4—399.9 MHz may be used by the mobile-satellite service, on condition that stations in this service do not cause harmful interference to those of other services operating or planned to be operated in accordance with the Table.

641A The bands 312–315 MHz (Earth-to-space) and 387–390 MHz (space-to-Earth) in the mobile-satellite service may also be used by non-geostationary-satellite systems. Such use is subject to the application of the coordination and notification procedures set forth in Resolution 46 (WARC–92).

642 The frequency 243 MHz is the frequency in this band for use by survival craft stations and equipment used for survival purposes (see Article 38).

643 Subject to agreement obtained under the procedure set forth in Article 14, the band 267—272 MHz may be used by administrations for space telemetry in their countries on a primary 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).

645 Limited to Instrument Landing Systems (glide path).

645A *Additional allocation:* In Afghanistan, the Federal Republic of Germany, Austria, Belgium, Cyprus, Denmark, Egypt, Spain, France, Greece, Israel, Italy, Japan, Jordan, Malta, Morocco, Monaco, Norway, the Netherlands, Portugal, the United Kingdom, Sweden, Switzerland, Syria and Turkey, the band 328.6–335.4 MHz is also allocated to the mobile service on a secondary basis subject to agreement obtained under the procedure set forth in Article 14. In order to ensure that harmful interference is not caused to stations of the aeronautical radionavigation service, stations of the mobile service shall not be introduced in the band until it is no longer required for the aeronautical radionavigation service by any administration which may be identified in the application of Article 14.

645B Recognizing that the use of the band 399.9–400.05 MHz by the fixed and mobile service may cause harmful interference to the radionavigation satellite service, administrations are urged not to authorize such use in application of No. 342.

646 Emissions shall be confined in a band of ± 25 kHz about the standard frequency 400.1 MHz.

647 *Additional allocation:* In Afghanistan, Saudi Arabia, Austria, Bahrain, Bulgaria, Colombia, Costa Rica, Cuba, Egypt, the United Arab Emirates, Ecuador, Hungary, Indonesia, Iran, Iraq, Israel, Kuwait, Liberia, Malaysia, Nigeria, Oman, Pakistan, the Philippines, Poland, Qatar, Syria, the German Democratic Republic, Roumania, Singapore, Somalia, Sri Lanka, Czechoslovakia, Thailand, the U.S.S.R. and Yugoslavia, the band 400.05—401 MHz is also allocated to the fixed and mobile services on a primary basis.

647A The band 400.15–401 MHz is also allocated to the space research service in the space-to-space direction for communications with manned space vehicles. In this application, the space research service will not be regarded as a safety service.

647B The use of the band 400.15–401 MHz by the mobile-satellite service is subject to the application of the coordination and notification procedures set forth in Resolution RES46 (WARC–92). However, coordination of a space station of the mobile-satellite service with respect to terrestrial services is required only if the power flux-density produced by the station exceeds −125 dB(W/m²/4kHz) at the Earth's surface. The above power flux-density limit shall apply until such time as a competent world administrative radio conference revises it. In making assignments to the space stations in the mobile-satellite service in the above band, administrations shall take all practicable steps to protect the radio astronomy service in the band 406.1–410 MHz from harmful interference from unwanted emissions.

648 *Additional allocation:* In Canada, the bands 405.5—406 MHz and 406.1—410 MHz are also allocated to the mobile-satellite, except aeronautical mobile-satellite, service (Earth-to-space), on a primary basis, subject to

agreement obtained under the procedure set forth in Article 14.

649 The use of the band 406–406.1 MHz by the mobile-satellite service is limited to low power satellite emergency position-indicating radiobeacons (see also Articles 38 and N 38).

649A Any emission capable of causing harmful interference to the authorized uses of the band 406–406.1 MHz is prohibited.

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 parcticable 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).

651 *Different category of service:* In Australia, the United States, India, Japan and the United Kingdom, the allocation of the bands 420—430 MHz and 440—450 MHz to the radiolocation service is on a primary basis (see No. 425).

652 *Additional allocation:* In Australia, the United States, Jamaica and the Philippines, the bands 420—430 MHz and 440—450 MHz are also allocated to the amateur service on a secondary basis.

653 *Additional allocation:* In China, India, the German Democratic Republic, the United Kingdom and the U.S.S.R., the band 420—460 MHz is also allocated to the aeronautical radionavigation service (radio altimeters) on a secondary basis.

654 *Different category of service:* In France, the allocation of the band 430—434 MHz to the amateur service is on a secondary basis (see No. 424).

655 *Different category of service:* In Denmark, Libya, Norway and Sweden, the allocation of the bands 430—432 MHz and 438—440 MHz to the radiolocation service on a secondary basis (see No. 424).

656 *Alternative allocation:* In Denmark, Norway and Sweden, the bands 430—432 MHz and 438—440 MHz are allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis.

657 *Additional allocation:* In Finland, Libya and Yugoslavia, the bands 430—432 MHz and 438—440 MHz are also allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis.

658 *Additional allocation:* In Afghanistan, Algeria, Saudi Arabia, Bahrain, Bangladesh, Brunei, Burundi, Egypt, the United Arab Emirates, Ecuador, Ethiopia, Greece, Guinea, India, Indonesia, Iran, Iraq, Israel, Italy, Jordan, Kenya, Kuwait, Lebanon, Liechtenstein, Libya, Malaysia, Malta, Nigeria, Oman, Pakistan, the Philippines, Qatar, Syria, Singapore, Somalia, Switzerland, Tanzania, Thailand and Togo, the band 430—440 MHz is also allocated to the fixed service on a primary basis and the bands 430—435 MHz and 438—440 MHz are also allocated to the mobile, except aeronautical mobile, service on a primary basis.

659 *Additional allocation:* In Angola, Bulgaria, Cameroon, Congo, Gabon, Hungary, Mali, Mongolia, Niger, Poland, the German Democratic Republic, Roumania, Rwanda, Chad, Czechoslovakia and the U.S.S.R., the band 430—440 MHz is also allocated to the fixed service on a primary basis.

660 *Different category of service:* In Argentina, Colombia, Costa Rica, Cuba, Honduras, Panama and Venezuela, the allocation of the band 430—440 MHz to the amateur service is on a primary basis (see No. 425).

660A *Additional allocation:* in Mexico, the bands 430–435 MHz and 438–440 MHz are also allocated on a primary basis to the land mobile service, subject to agreement obtained under the procedure set forth in Article 14.

661 In Region 1, except in the countries mentioned in No. 662, the band 433.05—434.79 MHz (centre frequency 433.92 MHz) is designated 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 radiocommunications services might be affected. In applying this provision, administrations shall have due regard to the latest relevant CCIR Recommendations.

662 In the Federal Republic of Germany, Austria, Liechtenstein, Portugal, Switzerland and Yugoslavia, the band 433.05—434.79 MHz (centre frequency 433.92 MHz) is designated for industrial, scientific and medical (ISM) applications. Radiocommunication services of these countries operating within this band must accept harmful interference which may be caused by these applications. ISM equipment operating in this band is subject to the provisions of No. 1815.

663 *Additional allocation:* In Brazil, France and the French Overseas Departments in Region 2, and India, the band 433.75—434.25 MHz is also allocated to the space operation service (Earth-to-space) on a primary basis until 1 January 1990, subject to agreement obtained under the procedure set forth in Article 14. After 1 January 1990, the band 433.75—434.25 MHz will be allocated in the same countries to the same service on a secondary basis.

664 In the bands 435—438 MHz, 1 260—1 270 MHz, 2 400—2 450 MHz, 3 400—3 410 MHz (in Regions 2 and 3 only) and 5 650—5 670 MHz, the amateur-satellite service may operate subject to not causing harmful interference to other services operating in accordance with the Table (see No. 435). Administrations authorizing such use shall ensure that any harmful interference caused by emissions from a station in the amateur-satellite service is immediately eliminated in accordance with the provisions of No. 2741. The use of

the bands 1 260—1 270 MHz and 5 650—5 670 MHz by the amateur-satellite service is limited to the Earth-to-space direction.

665 *Additional allocation:* In Austria, the band 438—440 MHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis.

666 *Additional allocation:* In Canada, New Zealand and Papua New Guinea, the band 440—450 MHz is also allocated to the amateur service on a secondary basis.

667 *Different category of service:* In Canada, the allocation of the band 440—450 MHz to the radiolocation service is on a primary basis (see No. 425).

668 Subject to agreement obtained under the procedure set forth in Article 14, the band 449.75—450.25 MHz may be used for the space operation service (Earth-to-space) and the space research service (Earth-to-space).

669 In the maritime mobile service, the frequencies 457.525 MHz, 457.550 MHz, 457.575 MHz, 467.525 MHz, 467.550 MHz and 467.575 MHz may be used by on-board communication stations. The use of these frequencies in territorial waters may be subject to the national regulations of the administration concerned. The characteristics of the equipment used shall conform to those specified in Appendix 20.

670 In the territorial waters of Canada, the United States and the Philippines, the preferred frequencies for use by on-board communication stations shall be 457.525 MHz, 457.550 MHz, 457.575 MHz and 457.600 MHz paired, respectively, with 467.750 MHz, 467.775 MHz, 467.800 MHz and 467.825 MHz. The characteristics of the equipment used shall conform to those specified in Appendix 20.

671 Earth exploration-satellite service applications, other than the meteorological-satellite service, may also be used in the bands 460—470 MHz and 1 690—1 710 MHz for space-to-Earth transmissions subject to not causing harmful interference to stations operating in accordance with the Table.

672 *Different category of service:* In Afghanistan, Bulgaria, China, Cuba, Japan, Mongolia, Czechoslovakia and the U.S.S.R., the allocation of the band 460–470 MHz to the meteorological-satellite service (space-to-Earth) is on a primary basis (see No. 425) and is subject to agreement obtained under the procedure set forth in Article 14.

673 *Additional allocation:* In China, the band 470—485 MHz is also allocated to the space research (space-to-Earth) and the space operation (space-to-Earth) services on a primary basis subject to agreement obtained under the procedure set forth in Article 14, subject to not causing harmful interference to existing and planned broadcasting stations.

674 *Different category of service:* in Mexico and Venezuela, the allocation of the band 470–512 MHz to the fixed and mobile service, and in Argentina and Uruguay to the mobile service, is on a primary basis (see No. 425), subject to agreement obtained under the procedure set forth in Article 14.

675 *Additional allocation:* In Chile, Columbia, Cuba, Ecuador, the United States, Guyana, Honduras, Jamaica, Mexico and Panama, the allocation of the bands 470–512 MHz and 614–806 MHz to the fixed and mobile services is on a primary basis (see No. 425), subject to agreement obtained under the procedure set forth in Article 14.

676 *Additional allocation:* In Burundi, Cameroon, the Congo, Ethiopia, Israel, Kenya, Lebanon, Libya, Malawi, Senegal, Sudan, Syria, and Yemen, the band 470–582 MHz is also allocated to the fixed service on a secondary basis.

677 *Alternative allocation:* In Pakistan, the bands 470—582 MHz and 610—890 MHz are allocated to the broadcasting service on a primary basis.

677A *Additional allocation:* in the Federal Republic of Germany, Austria, Belgium, Cyprus, Denmark, Spain, Finland, France, Ireland, Israel, Italy, Libya, Malta, Morocco, Monaco, Norway, the Netherlands, Portugal, the United Kingdom, Sweden, Switzerland, Swaziland, Syria, Tunisia and Turkey, the band 470–790 MHz is also allocated on a secondary basis to the land mobile service, intended for applications ancillary to broadcasting. Stations of the land mobile service in the countries mentioned in this footnote, shall not cause harmful interference to existing or planned stations operating in accordance with the Table of Frequency Allocations in countries other than those listed in this footnote.

678 *Additional allocation:* In Costa Rica, Cuba, El Salvador, Ecuador, the United States, Guatemala, Guyana, Honduras, Jamaica, Mexico and Venezuela, the band 512–608 MHz is also allocated to the fixed and mobile services on a primary basis, subject to agreement obtained under the procedures set forth in Article 14.

679 *Additional allocation:* In India, the band 549.75—550.25 MHz is also allocated to the space operation service (space-to-Earth) on a secondary basis.

683 *Additional allocation:* In Oman, the band 582—606 MHz is also allocated to the radionavigation service on a secondary basis.

684 *Additional allocation:* In Israel, Libya, Syria and Sudan, the band 582—790 MHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a secondary basis.

685 *Additional allocation:* In Denmark and Kuwait, the band 590—598 MHz is also allocated to the aeronautical radionavigation service on a primary basis until 1 January 1995.

686 *Additional allocation:* In the United Kingdom, the band 598—590 MHz is also allocated to the aeronautical radionavigation

service on a primary basis. All new assignments to stations in the aeronautical radionavigation service, including those transferred from the adjacent bands, shall be subject to coordination with the administrations of the following countries: the Federal Republic of Germany, Belgium, Denmark, Spain, France, Ireland, Luxembourg, Morocco, Norway and the Netherlands.

686A *Additional allocation:* in the United Kingdom, the band 598–606 MHz is also allocated to the aeronautical radionavigation service on a primary basis until 31 December 1994. All new assignments to stations in the aeronautical radionavigation service in this band are subject to the agreement of the Administrations of the following countries: the Federal Republic of Germany, Belgium, Denmark, Spain, France, Ireland, Luxembourg, Morocco, Norway and the Netherlands.

687 *Additional allocation:* In the African Broadcasting Area (see Nos. 400 to 403), the band 606—614 MHz is also allocated to the radio astronomy service on a permitted basis.

688 *Additional allocation:* In China, the band 606—614 MHz is also allocated to the radio astronomy service on a primary basis.

689 In Region 1, except in the African Broadcasting Area (see Nos. 400 to 403), and in Region 3, the band 608—614 MHz is also allocated to the radio astronomy service on a secondary basis. In making assignments to stations or 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).

690 *Additional allocation:* In India, the band 608—614 MHz is also allocated to the radio astronomy service on a primary basis.

691 *Additional allocation:* In New Zealand, the band 610—620 MHz is also allocated to the amateur service on a secondary basis.

692 *Different category of service:* In Costa Rica, El Salvador and Honduras, the allocation of the band 614—806 MHz to the fixed service is on a primary basis (see No. 425), subject to agreement obtained under the procedure set forth in Article 14.

692A *Additional allocation:* in Cuba, the band 614–890 MHz is also allocated to the radionavigation service on a primary basis, subject to agreement obtained under the procedure set forth in Article 14.

693 Within the frequency band 620—790 MHz, assignments may be made to television stations using frequency modulation in the broadcasting-satellite service subject to agreement between administrations concerned and those having services, operating in accordance with the Table, which may be affected (see Resolutions 33 and 507). Such stations shall not produce a power flux-density in excess of the value −129 dB(W/m²) for angles of arrival less than 20° (see Recommendation 705) within the territories of other countries without the consent of the administrations of those countries.

694 *Additional allocation:* In Bulgaria, Hungary, Mongolia, Poland, the German Democratic Republic, Roumania, Czechoslovakia and the U.S.S.R., the band 645—862 MHz is also allocated to the aeronautical radionavigation service on a permitted basis.

695 *Alternative allocation:* In Spain and France, the band 790—830 MHz is allocated to the broadcasting service on a primary basis.

695A *Additional allocation:* in Austria, Italy, the United Kingdom and Swaziland, the band 790–862 MHz is also allocated to the land mobile service on a secondary basis.

696 *Alternative allocation:* In Greece, Italy, Morocco and Tunisia, the band 790—838 MHz is allocated to the braodcasting service on a primary basis.

697 *Additional allocation:* In the Federal Republic of Germany, Burkina Faso, Cameroon, Côte d'Ivoire, Denmark, Egypt, Finland, Israel, Kenya, Libya, Liechtenstein, Monaco, Norway, the Netherlands, Portugal, Sweden, Switzerland and Yugoslavia, the band 790–830 MHz, and in these same countries and in Spain, France, Malta, the Gabonese Republic and Syria, the band 830–862 MHz, are also allocated to the mobile, except aeronautical mobile, service on a primary basis. However, stations of the mobile service in the countries mentioned in connection with each band referred to in this footnote shall not cause harmful interference to, or claim protection from, stations of services operating in accordance with the Table in countries other than those mentioned in connection with this band.

700 *Additional allocation:* in Region 2, the band 806–890 MHz is also allocated to the mobile-satellite service on a primary basis. The use of this service is intended for operation within national boundaries and subject to agreement obtained under the procedure set forth in Article 14.

700A *Additional allocation:* in Canada, the United States and Mexico, the bands 849–851 MHz and 894–896 MHz are also allocated to the aeronautical mobile service on a primary basis, for public correspondence with aircraft. The use of the band 849–851 MHz is limited to transmissions from aeronautical stations and the use of the band 894–896 MHz is limited to transmissions from aircraft stations.

700B *Additional allocation:* in Belarus, the Russian Federation and Ukraine, the bands 806–840 MHz (Earth-to-space) and 856–890 MHz (space-to-Earth) are also allocated to the mobile-satellite, except aeronautical mobile-satellite (R) service. The use of these bands by this service shall not cause harmful interference to, or claim protection from, services in other countries operating in accordance

with the Table of Frequency Allocations and is subject to special agreements between the administrations concerned.

701 *Additional allocation:* in Region 3, the bands 806–890 MHz and 942–960 MHz are also allocated to the mobile-satellite, except aeronautical mobile-satellite (R), service on a primary basis. The use of this service is limited to operation within national boundaries and subject to agreement obtained under the procedure set forth in Article 14. In seeking such agreement, appropriate protection shall be afforded to services operating in accordance with the Table, to ensure that no harmful interference is caused to such services.

702 *Alternative allocation:* In Italy, the band 838–854 MHz is allocated to the broadcasting service on a primary basis as from 1 January 1995. 1703 In Region 1, in the band 862–960 MHz, stations of the broadcasting service shall be operated only in the African Broadcasting Area (see Nos. 400 to 403) excluding Algeria, Egypt, Spain, Libya and Morocco, subject to agreement obtained under the procedure set forth in Article 14.

703 In region 1, in the band 862–960 MHz, stations of the broadcasting service shall be operated only in the African Broadcasting Area (see Nos. 400 to 403) excluding Algeria, Egypt, Spain, Libya and Morocco, subject to agreement obtained under the procedure set forth in Article 14.

704 *Additional allocation:* In Bulgaria, Hungary, Mongolia, Poland, the German Democratic Republic, Roumania, Czechoslovakia and the U.S.S.R., the band 862—960 MHz is also allocated to the aeronautical radionavigation service on a permitted basis until 1 January 1998. Up to this date, the aeronautical radionavigation service may use the band, subject to agreement obtained under the procedure set forth in Article 14. After this date, the aeronautical radionavigation service may continue to operate on a secondary basis.

704A *Additional allocation:* in Brazil, Canada and the United States of America, the band 890–896 MHz is also allocated to the mobile-satellite service on a primary basis. The use of this service is intended for operation within national boundaries and subject to agreement obtained under the procedure set forth in Article 14. In seeking such agreement, appropriate protection shall be afforded to services operating in accordance with the Table.

705 *Different category of service:* In the United States, the allocation of the band 890—942 MHz to the radiolocation service is on a primary basis (see No. 425) and subject to agreement obtained under the procedure set forth in Article 14.

706 *Different category of service:* In Australia, the allocation of the band 890—942 MHz to the radiolocation service is on a primary basis (see No. 425).

707 In Region 2, the band 902—928 MHz (centre frequency 915 MHz) is designated for industrial, scientific and medical (ISM) applications. Radiocommunication service operating within this band must accept harmful interference which may be caused by these applications. ISM equipment operating in this band is subject to the provisions of No. 1815.

707A *Different category of service:* in Chile, the band 903–905 MHz is allocated to the mobile, except aeronautical mobile, service on a primary basis and is subject to agreement obtained under the procedure set forth in Article 14.

709 The band 960—1 215 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 facilities.

710 Use of the radionavigation-satellite service in the band 1 215—1 260 MHz shall be subject to the condition that no harmful interference is caused to the radionavigation service authorized under footnote 712.

711 *Additional allocation:* In Afghanistan, Angola, Saudi Arabia, Bahrain, Bangladesh, Cameroon, China, the United Arab Emirates, Ethiopia, Guinea, Guyana, India, Indonesia, Iran, Iraq, Israel, Japan, Jordan, Kuwait, Lebanon, Libya, Malawi, Morocco, Mozambique, Nepal, Nigeria, Oman, Pakistan, the Philippines, Qatar, Syria, Somalia, Sudan, Sri Lanka, Chad, Thailand, Togo and Yemen (P.D.R. of), the band 1 215—1 300 MHz is also allocated to the fixed and mobile services on a primary basis.

712 *Additional allocation:* In Algeria, the Federal Republic of Germany, Austria, Bahrain, Belgium, Benin, Burundi, Cameroon, China, Denmark, the United Arab Emirates, France, Greece, India, Iran, Iraq, Kenya, Liechtenstein, Luxembourg, Mali, Mauritania, Norway, Oman, Pakistan, the Netherlands, Portugal, Qatar, Senegal, Somalia, Sudan, Sri Lanka, Sweden, Switzerland, Tanzania, Turkey and Yugoslavia, the band 1 215—1 300 MHz is also allocated to the radionavigation service on a primary basis.

712A *Additional allocation:* in Cuba, the band 1215–1300 MHz is also allocated to the radionavigation service on a primary basis subject to the agreement obtained under the procedure set forth in Article 14.

713 In the bands 1 215—1 300 MHz, 3 100—3 300 MHz, 5 250—5 350 MHz, 8 550—8 650 MHz, 9 500—9 800 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 1 240—1 300 MHz and 1 350—1 370 MHz are also allocated to the aeronautical radionavigation service on a primary basis.

715 *Additional allocation:* In Indonesia, the band 1 300—1 350 MHz is also allocated to the fixed and mobile services on a primary basis.

716 *Alternative allocation:* In Ireland and the United Kingdom, the band 1 300—1 350 MHz is allocated to the radiolocation service on a primary basis.

717 The use of the bands 1 300—1 350 MHz, 2 700—2 900 MHz and 9 000—9 200 MHz by the aeronautical radionavigation service is restricted to ground-based radars and to 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).

719 In Bulgaria, Hungary, Mongolia, Poland, the German Democratic Republic, Roumania, Czechoslovakia and the U.S.S.R., the existing installations of the radionavigation service may continue to operate in the band 1 350—1 400 MHz.

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 by some countries in a programme for the search for intentional emissions of extra-terrestrial origin.

723 In Region 2, in Australia and Papua New Guinea, the use of the band 1 435—1 535 MHz by the aeronautical mobile service for telemetry has priority over other uses by the mobile service.

723A *Different category of service:* in Cuba, the band 1525–1530 MHz is allocated to the aeronautical mobile service on a primary basis, under the conditions specified in No. 723.

723B Additional allocation: In Belarus, the Russian Federation and Ukraine, the band 1429–1535 MHz is also allocated to the aeronautical mobile service on a primary basis exclusively for the purposes of aeronautical telemetry within the national territory. As of 1 April 2007, the use of the band 1452–1492 MHz is subject to agreement between the administrations concerned.

724 Different category of service: In Afghanistan, Saudi Arabia, Bahrain, Bulgaria, Cameroon, Egypt, The United Arab Emirates, France, Iran, Iraq, Israel, Kuwait, the Lebanon, Morocco, Mongolia, Oman, Poland, Qatar, Syria, the German Democratic Republic, Romania, Czechoslovakia, the U.S.S.R., Yemen and Yugoslavia, the allocation of the band 1525–1530 MHz to the mobile, except aeronautical mobile, service is on a primary basis (see No. 425).

725 *Additional allocation:* In the U.S.S.R., the band 1 525—1 530 MHz is also allocated to the aeronautical mobile service on a primary basis.

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 specified fixed point in any of the mobile-satellite services may be authorized by an administration to communicate via space stations using these bands.

726B The use of the bands 1525–1530 MHz, 1533–1544 MHz, 1626.5–1631.5 MHz and 1634.5–1645.5 MHz by the land mobile-satellite service is limited to non-speech low bit-rate data transmissions.

726C Additional allocation: In Argentina, Australia, Brazil, Canada, the United States, Malaysia and Mexico, the band 1530–1544 MHz is allocated to the mobile-satellite (space-to-Earth) service, and the band 1626.5–1645.5 MHz is also allocated to the mobile-satellite (Earth-to-space) service, on a primary basis subject to the following conditions: maritime mobile-satellite distress and safety communications shall have priority access and immediate availability over all other mobile-satellite communications operating under this provision. Communications of mobile-satellite system stations not participating in the global maritime distress and safety system (GMDSS) shall operate on secondary basis to distress and safety communications of stations operating in the GMDSS. Account shall be taken of the priority of safety-related communications in the other mobile-satellite services.

726D The use of the bands 1525–1559 and 1626.5–1660.5 MHz by the mobile-satellite services are subject to the application of the coordination and notification procedures set forth in Resolution 46 (WARC–92). In Regions 1 and 3 in the band 1525–1530 MHz coordination of space stations of the mobile-satellite services with respect to terrestrial services is required only if the power flux-density produced at the Earth's surface exceeds the limits in No. 2566. In respect of assignments operating in the band 1525–1530 MHz, the provisions of section II, paragraph 2.2 of Resolution 46 (WARC–92) shall also be applied to geostationary transmitting space stations with respect to terrestrial stations.

727 *Additional allocation:* In Afghanistan, Saudi Arabia, Bahrain, Bangladesh, Congo, Egypt, the United Arab Emirates, Ethiopia, Iran, Iraq, Israel, Jordan, Pakistan, Qatar, Sudan, Sri Lanka, Syria, Somalia, Chad, Thailand, Togo, Yemen (P.D.R. of) and Zambia, the bands 1 540—1 645.5 and 1 646.5—

1 660 MHz are also allocated to the fixed service on a secondary basis.

727A The use of the band 1544–1545 MHz by the mobile-satellite service (space-to-earth) is limited to distress and safety communications (see Article N 38).

729 Transmissions in the band 1545–1555 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.

729A Notwithstanding any other provisions of the Radio Regulations relating to restrictions in the use of the bands allocated to the aeronautical mobile-satellite (R) service for public correspondence, the bands 1545–1555 MHz and 1646.5–1656.5 MHz may be authorized by administrations for public correspondence with aircraft earth stations. Such communications must cease immediately, if necessary, to permit transmission of messages with priority 1 to 6 in Article 51.

730 *Additional allocation:* In the Federal Republic of Germany, Austria, Bulgaria, Cameroon, Guinea, Hungary, Indonesia, Libya, Mali, Mongolia, Nigeria, Poland, the German Democratic Republic, Roumania, Senegal, Czechoslovakia and the U.S.S.R., the bands 1 550—1 645.5 and 1 646.5—1660 MHz are also allocated to the fixed service on a primary basis.

730A In the bands 1555–1559 and 1656.5–1660.5 MHz administrations may also authorize aircraft earth stations and ship earth stations to communicate with space stations in the land mobile-satellite service (see Resolution 208 (Mob–87)).

730B Alternative allocation: In Australia, Canada and Mexico, the band 1555–1559 MHz is allocated to the mobile-satellite (space-to-Earth) service, the band 1656.5–1660 MHz is allocated to the mobile-satellite (Earth-to-space) service, and the band 1660–1660.5 MHz is allocated to the mobile-satellite (Earth-to-space) and the radio astronomy services, on a primary basis.

730C Alternative allocation: In Argentina and the United States, the band 1555–1559 MHz is allocated to the mobile-satellite (space-to-Earth) service, the band 1656.5–1660 MHz is allocated to the mobile-satellite (Earth-to-space) service, and the band 1660–1660.5 MHz is allocated to the mobile-satellite (Earth-to-space) and radio astronomy services, on a primary basis subject to the following conditions: the aeronautical mobile-satellite (R) service shall have priority access and immediate availability over all other mobile-satellite communications within a network operating under this provision; mobile-satellite systems shall be interoperable with the aeronautical mobile-satellite (R) service; account shall be taken of the priority of safety-related communications in the other mobile-satellite services.

731 *Alternative allocation:* in Sweden, the band 1590–1626.5 MHz is allocated to the aeronautical radionavigation service on a primary basis.

731E—The use of the band 1610–1626.5 MHz by the mobile-satellite service (Earth-to-space) and by the radiodetermination-satellite service (Earth-to-space) is subject to the application of the coordination and notification procedures set forth in Resolution 46 (WARC–92). A mobile earth station operating in either of the services in this band shall not produce an e.i.r.p. density in excess of −15 dB(W/4 kHz) in the part of the band used by systems operating in accordance with the provisions of No. 732, unless otherwise agreed by the affected administrations. In the part of the band where such systems are not operating, a value of −3 dB (W/4 kHz) is applicable. Stations of the mobile-satellite service shall not cause harmful interference to, or claim protection from, stations in the aeronautical radionavigation service, stations operating in accordance with the provisions of No. 732 and stations in the fixed service operating in accordance with the provisions of No. 730.

731F—The use of the band 1613.8–1626.5 MHz by the mobile-satellite service (space-to-Earth) is subject to the application of the coordination and notification procedures set forth in Resolution 46 (WARC–92).

732 The band 1610—1626.5 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 band 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.

733A—With respect to the radiodetermination-satellite and mobile-satellite services the provisions of No. 953 do not apply in the frequency band 1610–1626.5 MHz.

733B *Different category of service:* in Angola, Australia, Burundi, Cote d'Ivoire, Ethiopia, India, Islamic Republic of Iran, Israel, Italy, Jordan, Kenya, Lebanon, Liberia, Libya, Madagascar, Mali, Pakistan, Papua New Guinea, Senegal, Sudan, Swaziland, Syria, Tanzania, Thailand, Togo, Zaire and Zambia the allocation of the band 1610–1626.5 MHz to the radiodetermination-satellite service (Earth-to-space) is on a primary basis (see No. 425) subject to agreement obtained under the procedure set forth in Article 14 with other countries not listed in this provision.

733C *Different category of service:* in Venezuela, the allocation to the radiodetermination-satellite service in the band 1610–1626.5

MHz is allocated exclusively to the aeronautical radionavigation service on a secondary basis.

733D *Alternative allocation:* in Cuba, the band 1610–1626.5 MHz is allocated exclusively to the aeronautical radionavigation service on a primary basis.

733E—Harmful interference shall not be caused to stations of the radio astronomy service using the band 1610.6–1613.8 MHz by stations of the radiodetermination-satellite and mobile-satellite services. (No. 2904 applies.)

733F In Region 1, the bands 1610–1626.5 MHz (Earth-to-space) and 2483.5–2500 MHz (space-to-Earth) are also allocated to the radiodetermination-satellite service on a secondary basis.

734—In making assignments to stations of other services, administrations are urged to take all practicable steps to protect the radio astronomy service in the band 1610.6–1613.8 MHz from harmful interference. Emissions from space or air-borne stations can be particularly serious sources of interference to the radio astronomy service (see Nos. 343 and 344 and Article 36).

734A Land earth stations and ship earth stations in the mobile-satellite services operating in the bands 1631.5–1634.5 and 1656.5–1660 MHz shall not cause harmful interference to the stations in the fixed service operating in the countries listed in No. 730.

734B The use of the band 1645.5–1646.5 MHz by the mobile satellite service (Earth-to-space) and for inter-satellite links is limited to distress and safety communications (see Article N 38).

735 Transmissions in the band 1646.5–1656.5 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.

735A In the band 1675–1710 MHz, stations in the mobile-satellite service shall not cause harmful interference to, nor constrain the development of, the meteorological-satellite and meteorological aids services (see Resolution 213 (WARC–92)) and the use of this band shall be subject to the provisions of Resolution 46 (WARC–92).

736 In making assignments to stations of other services to which the band 1 660—1 670 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).

737 *Different category of service:* In Afghanistan, Saudi Arabia, Bahrain, Benin, Bulgaria, Cameroon, the Central African Republic, the Congo, Cuba, Egypt, the United Arab Emirates, Ethiopia, Hungary, India, Indonesia, Pakistan, Poland, Qatar, Syria, the German Democratic Republic, Singapore, Somalia, Sri Lanka, Chad, Thailand, Czechoslovakia, Tunisia, the U.S.S.R., Yemen A.R., Yemen (P.D.R. of) and Yugoslavia, the allocation of the band 1 660.5—1 668.4 MHz to the fixed and the mobile, except aeronautical mobile, services is on a primary basis until 1 January 1990.

738 *Additional allocation:* In Bangladesh, India, Indonesia, Nigeria, Pakistan, Sri Lanka and Thailand, the band 1 660.5—1 668.4 MHz is also allocated to the meteorological aids service on a secondary basis.

739 In view of the successful detection by radio astronomers of two hydroxyl spectral lines in the region of 1 665 MHz 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 practicable.

740 *Additional allocation:* In Afghanistan, Costa Rica, Cuba, India, Iran, Malaysia, Pakistan, Singapore, Sri Lanka and Thailand, the band 1 690—1 700 MHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis.

740A The bands 1670–1675 MHz and 1800–1805 MHz are intended for use, on a worldwide basis, by administrations wishing to implement aeronautical public correspondence. The use of the band 1670–1675 MHz by stations in the systems for public correspondence with aircraft is limited to transmissions from aeronautical stations and the use of the band 1800–1805 MHz is limited to transmissions from aircraft stations.

741 *Different category of service:* In Saudia Arabia, Austria, Bahrain, Bulgaria, the Congo, Egypt, the United Arab Emirates, Ethiopia, Guinea, Hungary, Iraq, Israel, Jordan, Kenya, Kuwait, Lebanon, Mauritania, Mongolia, Oman, Poland, Qatar, Syria, the German Democratic Republic, Roumania, Somalia, Tanzania, Czechoslovakia, the U.S.S.R., Yemen A.R., Yemen (P.D.R. of) band 1 690—1 700 MHz to the fixed and mobile, except aeronautical mobile, service is on a primary basis (see No. 425).

742 *Additional allocation:* In Australia and Indonesia, the band 1 690—1 700 MHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a secondary basis.

743 *Additional allocation:* In India, Indonesia, Japan and Thailand, the band 1 700—1 710 MHz is also allocated to the space research service (space-to-Earth) on a primary basis.

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 of interference to the radio astronomy service (see Nos. 343 and 344 and Article 36).

745 Subject to agreement obtained under the procedure set forth in Article 14 and having particular regard to tropospheric scatter systems, the band 1 750—1 850 MHz may also be used for space operation (Earth-to-space) and space research (Earth-to-space) services in Region 2, in Afghanistan, Australia, India, Indonesia, Japan and Thailand.

746 *Additional allocation:* In Bulgaria, Cuba, Hungary, Mali, Mongolia, Poland, the German Democratic Republic, Roumania, Czechoslovakia and the U.S.S.R., the band 1 770—1 790 MHz is also allocated to the meteorological-satellite service on a primary basis, subject to agreement obtained under the procedure set forth in Article 14.

746A The frequency bands 1885–2025 MHz and 2110–2200 MHz are intended for use, on a worldwide basis, by administrations wishing to implement the future public land mobile telecommunication systems (FPLMTS). Such use does not preclude the use of these bands by other services to which these bands are allocated. The frequency bands should be made available for FPLMTS in accordance with Resolution 212 (WARC–92).

746B The use of the bands 1970–2010 MHz and 2160–2200 MHz by the mobile-satellite service shall not commerce before 1 January 2005 and is subject to the application of the coordination and notification procedures set forth in Resolution 46 (WARC–92). In the band 2160–2200 MHz coordination of space stations of the mobile-satellite service with respect to terrestrial services is required only if the power flux-density produced at the Earth's surface exceeds the limits in No. 2566. In respect of assignments operating in this band, the provisions of Section II, paragraph 2.2 of Resolution 46 (WARC–92) shall also be applied to geostationary transmitting space stations with respect to terrestrial stations.

746C In the United States of America, the use of the bands 1970–2010 MHz and 2160–2200 MHz by the mobile-satellite service shall not commence before 1 January 1996.

747A In making assignments to the mobile service in the bands 2025–2110 MHz and 2200–2290 MHz, administrations shall take into account Resolution 211 (WARC–92).

750A Administrations are urged to take all practical measures to ensure that space-to-space transmissions between two or more non-geostationary satellites, in the space research, space operations and Earth exploration-satellite services in the bands 2025–2110 MHz and 2200–2290 MHz, shall not impose any constraints on Earth-to-space, space-to-Earth and other space-to-space transmissions of those services and in those bands between geostationary and non-geostationary satellites.

750B *Additional allocation:* In the United States of America and India, the band 2310–2360 MHz is also allocated to the broadcasting-satellite service (sound) and complementary terrestrial broadcasting service on a primary basis. Such use is limited to digital audio broadcasting and is subject to the provisions of Resolution 528.

751 In Australia, the United States and Papua New Guinea, the use of the band 2 310—2 390 MHz by the aeronautical mobile service for telemetry has priority over other uses by the mobile services.

751A In France, the use of the band 2310–2360 MHz by the aeronautical mobile service for telemetry has priority over other uses by the mobile service.

751B Space stations of the broadcasting-satellite service in the band 2310–2360 MHz operating in accordance with No. 750B that may affect services to which this band is allocated in other countries shall be coordinated and notified in accordance with Resolution 33. Complementary terrestrial broadcasting stations shall be subject to bilateral coordination with neighboring countries prior to their bringing into use.

752 The band 2 400—2 500 MHz (centre frequency 2 450 MHz) is designated for industrial, scientific and medical (ISM) applications. Radio services operating within this band must accept harmful interference which may be caused by these applications. ISM equipment operating in this band is subject to the provisions of No. 1815.

753—Different category of service: in France, the band 2450–2500 MHz is allocated on a primary basis to the radiolocation service (see No. 425). Such use is subject to agreement with administrations having service operating or planned to operate in accordance with the Table of Frequency Allocations which may be affected.

753A In respect of the radiodetermination-satellite service in the band 2483.5–2500 MHz, the provisions of No. 953 do not apply.

753B In Region 1, in countries other than those listed in No. 753C, harmful interference shall not be caused to, or protection shall not be claimed from, stations of the radiolocation service by stations of the radiodetermination-satellite service.

753C—Different category of service: in Angola, Australia, Bangladesh, Burundi, China, Côte d'Ivoire, Ethiopia, India, the Islamic Republic of Iran, Israel, Italy, Jordan, Kenya, Lebanon, Liberia, Libya, Madagascar, Mali, Pakistan, Papua New Guinea, Senegal, Sudan, Swaziland, Syria, Tanzania, Thailand, Togo, Zaire and Zambia, the allocation of the band 2483.5–2500 MHz to the radiodetermination-satellite service (space-to-Earth) is on a primary basis (see No. 425)

subject to agreement obtained under the procedure of Article 14 with other countries not listed in this provision.

753D *Alternative allocation:* in Cuba, the band 2483.5–2500 MHz is allocated only to fixed, mobile and radiolocation services on a primary basis.

753F—The use of the band 2483.5–2500 MHz by the mobile-satellite and the radiodetermination-satellite services is subject to the application of the coordination and notification procedures set forth in Resolution 46 (WARC–92). Coordination of space stations of the mobile-satellite and radiodetermination-satellite services with respect to terrestrial services is required only if the power flux-density produced at the Earth's surface exceeds the limits in No. 2566. In respect of assignments operating in this band, the provisions of Section II, paragraph 2.2 of Resolution 46 (WARC–92) shall also be applied to geostationary transmitting space stations with respect to terrestrial stations.

754 Subject to agreement obtained under the procedure set forth in Article 14, the band 2 500—2 535 MHz may also be used in Region 3 for the mobile-satellite (space-to-Earth), except aeronautical mobile-Satellite, service for operation limited to within national boundaries.

754A *Additional allocation:* subject to agreement obtained under the procedure set forth in Article 14, the band 2500–2516.5 MHz may also be used in India, the Islamic Republic of Iran, Papua New Guinea and Thailand for the radiodetermination-satellite service (space-to-Earth) for operation limited to within national boundaries.

755 *Additional allocation:* In Canada, the band 2 500—2 550 MHz is also allocated to the radiolocation service on a primary basis.

756 *Additional allocation:* In the United Kingdom, the band 2 500—2 600 MHz is also allocated to the radiolocation service on a secondary basis.

757 The use of the band 2 500—2 690 MHz by the broadcasting-satellite service is limited to national and regional systems for community reception and such use shall be subject to agreement obtained under the procedure set forth in Article 14. The power flux-density at the Earth's surface shall not exceed the values given in Nos. 6561 to 6564.

758 *Alternative allocation:* In the Federal Republic of Germany and Greece, the band 2 500—2 690 MHz is allocated to the fixed service on a primary basis.

759 *Alternative allocation:* In Bulgaria and the U.S.S.R., the band 2 500—2 690 MHz is allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis.

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

761 The use of the bands 2 500—2 690 MHz in Region 2 and 2 500—2 535 MHz and 2 655—2 690 MHz in Region 3 by the fixed-satellite service is limited to national and regional systems; such use shall be subject to agreement obtained under the procedure set forth in Article 14, giving particular attention to the broadcasting-satellite service in Region 1. In the direction space-to-Earth, the power flux-density at the Earth's surface shall not exceed the values given in Nos. 2561 to 2564.

762 Administrations shall make all practicable efforts to avoid developing new tropospheric scatter systems in the band 2 500—2 690 MHz.

763 Subject to agreement obtained under the procedure set forth in Article 14, the band 2 500—2 690 MHz may be used for tropospheric scatter systems in Region 1.

764 When planning new tropospheric scatter radio-relay links in the band 2 500—2 690 MHz; all possible measures shall be taken to avoid directing the antennae of these links toward the geostationary-satellite orbit.

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).

766 Subject to agreement obtained under the procedure set forth in Article 14, the band 2 655—2 690 MHz may also be used in Region 3 for the mobile-satellite (Earth-to-space), except aeronautical mobile-satellite, service for operation limited to within national boundaries.

767 *Additional allocation:* In the Federal Republic of Germany and Austria, the band 2 690—2 695 MHz is also allocated to the fixed service on a primary basis. Such use is limited to equipment in operation by 1 January 1985.

768 All emissions in the band 2 690—2 700 MHz are prohibited, except those provided for by Nos. 767 and 769.

769 *Additional allocation:* In Afghanistan, Saudi Arabia, Bahrain, Bulgaria, Cameroon, the Central African Republic, the Congo, the Ivory Coast, Cuba, Egypt, the United Arab Emirates, Ethiopia, Gabon, Guinea, Guinea-Bissau, Hungary, Iran, Iraq, Israel, Lebanon, Malaysia, Malawi, Mali, Morocco, Mauritania, Mongolia, Nigeria, Oman, Pakistan, the Philippines, Poland, Qatar, the Syria, German Democratic Republic, Roumania, Singapore, Somalia, Sri Lanka, Czechoslovakia, Tunisia, Thailand, the U.S.S.R., Yemen A.R., Yemen (P.D.R. of), Yugoslavia, Zaire and Zambia, the band 2 690—2 700 MHz 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.

770 In the band 2 700—2 900 MHz, ground-based radars used for meteorological purposes are authorized to operate on a basis of equality with stations of the aeronautical radionavigation service.

771 *Additional allocation:* In Canada, the band 2 850—2 900 MHz is also allocated to the maritime radionavigation service, on a primary basis, for use by shore-based radars.

772 In the band 2900–3100 MHz, the use of the shipborne interrogator-transponder system (SIT) shall be confined to the sub-band 2930–2950 MHz.

773 The use of the band 2 900—3 100 MHz by the aeronautical radionavigation service is limited to ground based radars.

775A In the bands 2900–3100 MHz and 9300–9500 MHz, the response from radar transponders shall not be capable of being confused with the response from radar beacons (racons) and shall not cause interference for ship or aeronautical radars in the radionavigation service, having regard, however, to No. 347 of these Regulations.

777 *Additional location:* In Bulgaria, Canada, Cuba, Hungary, Mongolia, Poland, the German Democratic Republic, Roumania, Czechoslovakia and the U.S.S.R., the band 3 100—3 300 MHz is also allocated to the radionavigation service on a primary basis.

778 In making assignments to stations of other service, 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).

779 *Additional allocation:* In Afghanistan, Saudi Arabia, Bahrain, Bangladesh, China, the Congo, the United Arab Emirates, India, Indonesia, Iran, Iraq, Israel, Japan, Kuwait, Lebanon, Libya, Malaysia, Oman, Pakistan, Qatar, Syria, Singapore, Sri Lanka and Thailand, the band 3 300—3 400 MHz is also allocated to the fixed and mobile services on a primary basis. The countries bordering the Mediterranean shall not claim protection for their fixed and mobile services from the radiolocation service.

780 *Additional location:* In Bulgaria, Cuba, Hungary, Mongolia, Poland, the German Democratic Republic, Roumania, Czechoslovakia and the U.S.S.R., the band 3 300—3 400 MHz is also allocated to the radionavigation service on a primary basis.

781 *Additional allocation:* In the Federal Republic of Germany, Israel and the United Kingdom, the band 3 400—3 475 MHz is also allocated to the amateur service on a secondary basis.

782 *Different category of service:* In Austria, the allocation of the band 3 400—3 500 MHz to the radiolocation service is on a primary basis (see No. 425), subject to the agreement of the administrations of the following countries: Hungary, Italy, the German Democratic Republic, Czechoslovakia and Yugoslavia. Such use is limited to ground-based stations. However, this administration is urged to cease operations by 1985. After this date this administration shall take all practicable steps to protect the fixed-satellite service and coordination requirements shall not be imposed on the fixed-satellite service.

783 *Different category of service:* In Indonesia, Japan, Pakistan and Thailand, the allocation of the band 3 400—3 500 MHz to the mobile, except aeronautical mobile, service is on a primary basis (see No. 425).

784 In Regions 2 and 3, in the band 3 400—3 600 MHz the radiolocation service is allocated on a primary basis. However, all administrations operating radiolocation systems in this band are urged to cease operations by 1985. Thereafter, administrations shall take all practicable steps to protect the fixed-satellite service and coordination requirements shall not be imposed on the fixed-satellite service.

785 In Denmark, Norway and the United Kingdom, the fixed, radiolocation and fixed-satellite services operate on a basis of equality of rights in the band 3 400—3 600 MHz. However, these administrations operating radiolocation systems in this band are urged to cease operations by 1985. After this date these administrations shall take all practicable steps to protect the fixed-satellite service and coordination requirements shall not be imposed on the fixed-satellite service.

786 In Japan, in the band 3 620—3 700 MHz, the radiolocation service is excluded.

787 *Additional allocation:* In New Zealand, the band 3 700—3 770 MHz is also allocated to the radiolocation service on a secondary basis.

788 *Additional allocation:* In the Federal Republic of Germany, Denmark, Norway and Sweden, the band 4 200—4 210 MHz is also allocated to the fixed service on a secondary basis.

789 Use of the band 4 200—4 400 MHz by the aeronautical radionavigation service is reserved exclusively for radio altimeters installed on board aircraft and for the associated transponders on the ground. However, passive sensing in the Earth exploration-satellite and space research services may be authorized in this band on a secondary basis (no protection is provided by the radio altimeters).

790 *Additional allocation:* In China, Iran, Libya, the Philippines and Sri Lanka, the band 4 200—4 400 MHz is also allocated to the fixed service on a secondary basis.

791 The standard frequency and time signal-satellite service may be authorized to use the frequency 4 202 MHz for space-to-Earth transmissions and the frequency 6 427 MHz for Earth-to-space transmissions. Such

transmissions shall be confined within the limits of ±2 MHz of these frequencies and shall be subject to agreement obtained under the procedure set forth in Article 14.

792A The use of the bands 4 500–4 800 MHz, 6 725–7 025 MHz, 10.7–10.95 GHz, 11.2–11.45 GHz and 12.75–13.25 GHz by the fixed-satellite service shall be in accordance with the provisions of Appendix 30B.

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 Argentina, Australia and Canada, the allocation of the bands 4 825—4 835 MHz and 4 950—4 990 MHz to the radim astronomy service is on a primary basis. In making assignments to stations of other services to which these bands are allocated, administratimns 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 operatimn 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.

797A *Additional allocation:* in the countries listed in Nos. 733B and 753C, and subject to agreement obtained under the procedure set forth in Article 14, and band 5150–5216 MHz is also allocated to the radiodetermination-satellite service (space-to-Earth) on a primary basis. In Region 2, the band is also allocated to the radiodetermination-satellite service (space-to-Earth) on a primary basis. In regions 1 and 3, except those countries listed in Nos. 733B and 753C, the band is also allocated to the radiodetermination-satellite service (space-to-Earth) on a secondary basis. The use by the radiodetermination-satellite service is limited to feeder links in conjunction with the radiodetermination-satellite service operating in the bands 1610–1626.5 MHz and/or 2483.5–2500 MHz. The total power flux-density at the Earth's surface shall in no case exceed -159 dBW/m^2 in any 4 kHz band for all angles of arrival.

797B *Additional allocation:* in the Federal Republic of Germany, Austria, Denmark, Spain, France, Finland, Israel, Italy, Jordan, Morocco, Norway, the Netherlands, Pakistan, the United Kingdom, Sweden, Switzerland, Syria and Tunisia, the band 5150–5250 MHz is also allocated to the mobile service, on a primary basis, subject to the agreement obtained under the procedure set forth in Article 14.

798 *Additional allocation:* In Austria, Bulgaria, Hungary, Libya, Mongolia, Poland, the German Democratic Repubilc, Roumania, Czechoslovakia and the U.S.S.R., the band 5 250—5 350 MHz is also allocated to the radionavigation service on a primary basis.

799 The use of the band 5 350—5 470 MHz by the aeronautical radionavigational service is limited to airborne radars and associated airborne beacons.

800 *Additional allocation:* In Afghanistan, Austria, Bulgaria, Hungary, Iran, Mongolia, Poland, the German Democratic Republic, Roumania, Czechoslovakia and the U.S.S.R., the band 5 470—5 650 MHz is also allocated to the aeronautical radionavigation service on a primary basis.

801 *Additional allocation:* In the United Kingdom, the band 5 470—5 850 MHz is also allocated to the land mobile service on a secondary basis. The power limits specified in Nos. 2502, 2505, 2506 and 2507 shall apply in the band 5 725—5 850 MHz.

802 Between 5 600 MHz and 5 650 MHz, ground-based radars used for meterological purposes are authorized to operate on a basis of equality with stations of the maritime radionavigation service.

803 *Additional allocation:* In Afghanistan, Saudi Arabia, Bahrain, Bangladesh, Cameroon, Central African Republic, China, Congo, the Republic of Korea, Egypt, the United Arab Emirates, Gabon, Guinea, India, Indonesia, Iran, Iraq, Israel, Japan, Jordan, Kuwait, Lebanon, Libya, Madagascar, Malaysia, Malawi, Malta, Niger, Nigeria, Pakistan, the Philippines, Qatar, Syria, Singapore, Sri Lanka, Tanzania, Chad, Thailand and Yemen (P.D.R. of) the band 5 650—5 850 MHz is also allocated to the fixed and mobile services on a primary basis.

804 *Different category of service:* In Bulgaria, Cuba, Hungary, Mongolia, Poland, the German Democratic Republic, Czechoslovakia and the U.S.S.R., the allocation of the band 5 670—5 725 MHz to the space research service is on a primary basis (see No. 425).

805 *Additional allocation:* In Bulgaria, Cuba, Hungary, Mongolia, Poland, the German Democratic Republic, Czechoslovakia and the U.S.S.R., the bank 5 670—5 850 MHz is also allocated to the fixed service on a primary basis.

806 The band 5 725— 5 875 MHz (centre frequency 5 800 MHz) is designated for industrial, scientific and medical (ISM) applications. Radiocommunication services operating within this band must accept harmful interference which may be caused by these applications. ISM equipment operating in this band is subject to the provisions of No. 1815.

807 *Additional allocation:* In the Federal Republic of Germany, the band 5 755—5 850 MHz is also allocated to the fixed service on a primary basis.

808 The band 5 830—5 850 MHz is also allocated to the amateur-satellite service (space-to-Earth) on a secondary basis.

809 In the band 6 425—7 075 MHz, passive microwave sensor measurements are carried out over the oceans. In the band 7 075—7 250 MHz, passive microwave sensor measurements are carried out. Administrations should bear in mind the needs of the earth exploration-satellite (passive) and space research (passive) services in their future planning of this band.

810 Subject to agreement obtained under the procedure set forth in Article 14, in Region 2, the band 7 125—7 155 MHz may be used for Earth-to-space transmissions in the space operation service.

811 Subject to agreement obtained under the procedure set forth in Article 14, the band 7 145—7 235 MHz may be used for Earth-to-space transmissions in the space research service. The use of the band 7 145—7 190 MHz is restricted to deep space; no emissions to deep space shall be effected in the band 7 190—7 235 MHz.

812 The bands 7 250—7 375 MHz (space-to-Earth) and 7 900—8 025 MHz (Earth-to-space) may also be used by the mobile-satellite service. The use of these bands by this service shall be subject to agreement obtained under the procedure set forth in Article 14.

813 In the band 8 025—8 400 MHz the power flux-density limits specified in No. 2570 shall apply in Regions 1 and 3 to the earth exploration-satellite service.

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

815 Subject to agreement obtained under the procedure set forth in Article 14, the band 8 025—8 400 MHz may be used for the earth exploration-satellite service (space-to-Earth) in Bangladesh, Benin, Cameroon, China, the Central African Republic, the Ivory Coast, Egypt, France, Guinea, Upper Volta, India, Iran, Israel, Italy, Japan, Kenya, Libya, Mali, Niger, Pakistan, Senegal, Somalia, Sudan, Sweden, Tanzania, Zaire and Zambia, on a primary basis.

816 In the space research service, the use of the band 8 400—8 450 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 space research services on a primary basis.

819 *Additional allocation:* In Saudi Arabia, Bahrain, Bangladesh, Burundi, Cameroon, China, the Congo, Costa Rica, Egypt, the United Arab Emirates, Gabon, Guinea, Guyana, Indonesia, Iran, Iraq, Israel, Jamaica, Kuwait, Libya, Malaysia, Mali, Morocco, Mauritania, Nepal, Niger, Nigeria, Oman, Pakistan, Qatar, Syria, Senegal, Singapore, Somalia, Sri Lanka, Tanzania, Chad, Thailand, Togo and Tunisia, the band 8 500—8 750 MHz is also allocated to the fixed and mobile services on a primary basis.

820 *Additional allocation:* In Bulgaria, Hungary, Mongola, Poland, the German Democratic Republic, Rounmania, Czechoslovakia and the U.S.S.R., the band 8 500—8 750 MHz is also allocated to the land mobile and radionavigation services on a primary basis.

821 The use of the band 8 750—8 850 MHz by the aeronautical radionavigation service is limited to airborne doppler navigation aids on a centre frequency of 8 800 MHz.

822 *Additional allocation:* In Algeria, the Federal Republic of Germany, Bahrain, Belgium, China, the United Arab Emirates, France, Greece, Indonesia, Iran, Libya, the Netherlands, Oatar, Sudan and Thailand, the bands 8 825—8 850 MHz and 9 000—9 200 MHz are also allocated to the maritime radionavigation service, on a primary basis, for use by shore-based radars only.

823 In the bands 8 850—9 000 MHz and 9 200—9 225 MHz, the maritime radionavigation service is limited to shore-based radars.

824 *Additional allocation:* In Austria, Bulgaria, Cuba, Hungary, Mongolia, Poland, the German Democratic Republic, Roumania, Czechoslovakia and the U.S.S.R., bands 8 850—9 000 MHz and 9 200—9 300 MHz are also allocated to the radionavigation service on a primary basis.

824A In the band 9200–9500 MHz, search and rescue transponders (SART) may be used, having due regard to the appropriate CCIR Recommendation (see also Article N 38).

825 The use of the band 9 300—9 500 MHz by the aeronautical radionavigation service is limited to airborne weather radars and ground-based radars. In addition, ground-based radar beacons in the aeronautical radionavigation service are permitted in the band 9 300—9 320 MHz on condition that harmful interference is not caused to the maritime radionavigation service. In the

band 9 300—9 500 MHz, ground-based radars used for meteorological purposes have priority over other radiolocation devices.

825A In the band 9300–9320 MHz in the radionavigation service, the use of shipborne radars, other than those existing on 1 January 1976, is not permitted until 1 January 2001.

826 *Different category of service:* In Afghanistan, Saudi Arabia, Austria, Bahrain, Bangladesh, Cameroon, the Republic of Korea, Egypt, the United Arab Emirates, Ethiopia, Guyana, India, Indonesia, Iran, Iraq, Israel, Jamaica, Japan, Jordan, Kuwait, the Lebanon, Liberia, Malaysia, Nigeria, Pakistan, Qatar, Singapore, Somalia, Sudan, Sri Lanka, Sweden, Thailand, Trinidad and Tobago, and Yemen (P.D.R. of), the allocation of the band 9 800—10 000 MHz to the fixed service is on a primary basis (see No. 425).

827 *Additional allocation:* In Bulgaria, Hungary, Mongolia, Poland, the German Democratic Republic, Roumania, Czechoslovakia and the U.S.S.R., the band 9 800—10 000 MHz is also allocated to the radionavigation service on a primary basis.

828 The band 9 975—10 025 MHz is also allocated to the meteorological-satellite service on a secondary basis for use by weather radars.

829 *Additional allocation:* In Costa Rica, Ecuador, Guatemala, and Honduras, the band 10—10.45 GHz is also allocated to the fixed and mobile services on a primary basis.

830 *Additional allocation:* In the Federal Republic of Germany, Angola, China, Ecuador, Spain, Japan, Kenya, Morocco, Nigeria, Sweden, Tanzania and Thailand, the band 10.45—10.5 GHz is also allocated to the fixed and mobile services on a primary basis.

831 In the band 10.6—10.68 GHz, 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, 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 for by No. 834.

834 *Additional allocation:* In Saudi Arabia, Bahrain, Bulgaria, Cameroon, China, Colombia, the Republic of Korea, Costa Rica, Cuba, Egypt, the United Arab Emirates, Ecuador, Hungary, Iran, Iraq, Israel, Japan, Kuwait, 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, service on a primary basis. Such use is limited to equipment in operation by 1 January 1985.

835 In Region 1, the use of the band 10.7—11.7 GHz by the fixed-satellite service (Earth-to-space) is limited to feeder links for the broadcasting-satellite service.

836 In Region 2, in the band 11.7–12.2 GHz, transponders on space stations in the fixed-satellite service may be used additionally for transmissions in the broadcasting-satellite service, provided that such transmissions do not have a maximum e.i.r.p. greater than 53 dBW per television channel and do not cause greater interference or require more protection from interference that the coordinated fixed-satellite service frequency assignments. With respect to the space services, this band shall be used principally for the fixed-satellite service.

837 Different category of service: in Canada, Mexico and the United States, the allocation of the band 11.7–12.1 GHz to the fixed service is on a secondary basis (see No. 424).

838 In the band 11.7—12.5 GHz in Regions 1 and 3 the fixed, fixed-satellite, mobile, except aeronautical mobile, and broadcasting services, in accordance with their respective allocations, shall not cause harmful interference to broadcasting-satellite stations operating in accordance with the provisions of Appendix 30.

839 The use of the bands 11.7–12.2 GHz by the fixed-satellite service in Region 2 and 12.2–12.7 GHz by the broadcasting-satellite service in Region 2 is limited to national and subregional systems. The use of the band 11.7–12.2 GHz by the fixed-satellite service in Region 2 is subject to previous agreement between the administrations concerned and those having services, operating or planned or operate in accordance with the table, which may be affected (see Articles 11, 13 and 14). For the use of the band 12.2–12.7 GHz by the broadcasting-satellite service in Region 2, see Article 15.

842 *Additional allocation:* the band 12.1–12.2 GHz in Brazil and Peru, is also allocated to the fixed service on a primary basis.

844 In Region 2, in the band 12.2–12.7 GHz, existing and future terrestrial radiocommunication services shall not cause harmful interference to the space services

operating in conformity with the Broadcasting-Satellite Plan for Region 2 contained in Appendix 30 (Orb–85).

845 In Region 3 the band 12.2—12.5 GHz is also allocated to the fixed-satellite (space to Earth) service limited to national and subregional systems. The power flux-density limits in No. 2574 shall apply to this frequency band. The introduction of the service in relation to the broadcasting-satellite service in Region 1 shall follow the procedures specified in Article 7 of Appendix 30 with the applicable frequency band extended to cover 12.2—12.5 GHz.

846 In Region 2, in the band 12.2–12.7 GHz, assignments to stations of the broadcasting-satellite service in the Plan for Region 2 contained in Appendix 30 (Orb–85) may also be used for transmissions in the fixed-satellite service (space-to-Earth), provided that such transmissions do not cause more interference or require more protection from interference than the broadcasting-satellite service transmissions operating in conformity with the Region 2 Plan. With respect to the space services, this band shall be used principally for the broadcasting-satellite service.

847 The broadcasting-satellite service in the band 12.5–12.75 GHz in Region 3 is limited to community reception with a power flux-density not exceeding −111 dB(W/m²) as defined in Annex 5 of Appendix 30 (Orb–85). See also Resolution 34.

848 *Additional allocation:* In Algeria, Angola, Saudi Arabia, Bahrain, Cameroon, the Central African Republic, the Congo, the Ivory Coast, Egypt, the United Arab Emirates, Ethiopia, Gabon, Ghana, Guinea, Iraq, Israel, Jordan, Kenya, Kuwait, Lebanon, Libya, Madagascar, Mali, Morocco, Mongolia, Niger, Nigeria, Qatar, Syria, Senegal, Somalia, Sudan, Chad, Togo, Yemen (P.D.R. of) and Zaire, the band 12.5—12.75 GHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis.

849 *Additional allocation:* In the Federal Republic of Germany, Belgium, Denmark, Spain, Finland, France, Greece, Liechtenstein, Luxembourg, Monaco, Norway, Uganda, the Netherlands, Portugal, Roumania, Sweden, Switzerland, Tanzania, Tunisia and Yugoslavia, the band 12.5—12.75 GHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a secondary basis.

850 *Additional allocation:* In Austria, Bulgaria, Hungary, Poland, the German Democratic Republic, Czechoslovakia and the U.S.S.R., the band 12.5—12.75 GHz is also allocated to the fixed service and the mobile, except aeronautical mobile, service on a primary basis. However, stations in these services shall not cause harmful interference to fixed-satellite earth stations of countries in Region 1 other than those mentioned in this footnote. Coordination of these earth stations is not required with stations of the fixed and mobile services of the countries mentioned in this footnote.

851 The use of the band 13.25—13.4 GHz by the aeronautical radionavigation service is limited to Doppler navigation aids.

852 Subject to agreement obtained under the procedure set forth in Article 14, the band 13.25—13.4 GHz may also be used in the space research service (Earth-to-space) on a secondary basis.

853 *Additional allocation:* In Bangladesh, India and Pakistan, the band 13.25—14 GHz is also allocated to the fixed service on a primary basis.

854 *Additional allocation:* In Afghanistan, Algeria, Angola, Saudi Arabia, Bahrain, Cameroon, the Republic of Korea, Egypt, the United Arab Emirates, Finland, Gabon, Guinea, Indonesia, Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Madagascar, Malaysia, Malawi, Mali, Malta, Morocco, Mauritania, Niger, Nigeria, Pakistan, Qatar, Syria, Senegal, Singapore, Sri Lanka, Sudan, Sweden, Chad, Thailand and Tunisia, the band 13.4—14 GHz is also allocated to the fixed and mobile services on a primary basis.

855 *Additional allocation:* In Austria, Bulgaria, Hungary, Japan, Mongolia, Poland, the Germal Democratic Republic, Roumania, the United Kingdom, Czechoslovakia and the U.S.S.R., the band 13.4]14 GHz is also allocated to the radionavigation service on a primary basis.

856 The use of the band 14—14.3 EHz by the radionavigation service shall be such as to provide sufficient protection to space stations of the fixed-satellite service (see Recommendation 708).

857 *Additional allocation:* In Afghanistal, Algeria, Angola, Saudi Arabia, Australia, Bahrain, Bangladesh, Botswana, Cameroon, China, the Republic of Korea, Egypt, the United Arab Emirates, Gabon, Guatemala, Guinea, India, Indonesia, Iran, Iraq, Israel, Japan, Kenya, Kuwait, Lesotho, Lebanon, Malaysia, Malawi, Mali, Malta, Morocco, Mauritania, Niger, Pakistan, the Philippines, Qatar, Syria, Senegal, Singapore, Somalia, Sudan, Sri Lanka, Switzerland, Tanzania, Chad, Thailand and Yemen (P.D.R. of), the band 14—14.3 GHz is also allocated to the fixed service on a primary basis.

858 The band 14–14.5 GHz may be used, within the fixed-satellite service (Earth-to-space), for feeder links for the broadcasting-satellite service, subject to coordination with other networks in the fixed-satellite service. Such use of feeder links is reserved for countries outside Europe.

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

860 *Additional allocation:* In the Federal Republic of Germany, Austria, Belgium, Denmark, Spain, Finland, France, Greece,

Ireland, Iceland, Italy, Jordan, Libya, Liechtenstein, Luxembourg, Norway, the Netherlands, Portugal, the United Kingdom, Sweden, Switzerland, Turkey and Yugoslavia, the band 14.25—14.3 GHz is also allocated to the fixed service on a primary basis.

861 *Additional allocation:* In Japan, Pakistan, the United Kingdom and Thailand, the band 14.25—14.3 GHz is also allocated to the mobile, except aeronautical mobile, service on a primary basis.

862 In making assignments to stations of others 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).

863 The use of the band 14.5–14.8 GHz by the fixed-satellite service (Earth-to-space) is limited to feeder links for the broadcasting-satellite service. This use is reserved for countries outside Europe.

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, Pakistan, Iran, Iraq, Israel, Kuwait, Lebanon, Libya, 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.

866 *Additional allocation:* In Afghanistan, Algeria, Angola, Saudi Arabia, Austria, Bahrain, Bangladesh, Cameroon, Costa Rica, Egypt, El Salvador, the United Arab Emirates, Finland, Guatemala, India, Indonesia, Iran, Kuwait, Libya, Malaysia, Malawi, Malta, Morocco, Mozambique, Nepal, Nicaragua, Oman, Pakistan, Qatar, Singapore, Somalia, Sudan, Sri Lanka, Sweden, Tanzania, Chad, Thailand, Yemen (P.D.R. of) and Yugoslavia, the band 15.7—17.3 GHz is also allocated to the fixed and mobile services on a primary basis.

867 *Additional allocation:* In Israel, the band 15.7—17.3 GHz is also allocated to the fixed and mobile services on a primary basis. These services shall not claim protection from, or cause harmful interference to services operating in accordance with the Table in countries other than those included in 866.

868 Additional allocation: in Afghanistan, Algeria, the Federal Republic of Germany, Angola, Saudi Arabia, Austria, Bahrain, Bangladesh, Cameroon, Costa Rica, El Salvador, the United Arab Emirates, Finland, Guatemala, Honduras, India, Indonesia, the Islamic Republic of Iran, Iraq, Israel, Japan, Kuwait, Libya, Nepal, Nicaragua, Oman, Pakistan, Qatar, Sudan, Sri Lanka, Sweden, Thailand, and Yugoslavia, the band 17.3–17.7 GHz is also allocated to the fixed and mobile services on a secondary basis. The power limits given in Nos. 2505 and 2508 shall apply.

869 The use of the band 17.3–18.1 GHz by the fixed-satellite service (Earth-to-space) is limited to feeder links for the broadcasting-satellite service. For the use of the band 17.3–17.8 GHz in Region 2 by the feeder links for the broadcasting-satellite service in the band 12.2–12.7 GHz, see Article 15A.

870 The band 18.1—18.3 GHz is also allocated to the meteorological-satellite service (Earth-to-space) on a primary basis. Its use is limited to geostationary satellites and shall be in accordance with the provisions of No. 2578.

871 In making assignments to stations in the fixed and mobile services, administrations are invited to take account of passive sensors in the earth-exploration satellite and space research services operating in the band 18.6—18.8 GHz. In this band, administrations should endeavor to limit as far as possible both the power delivered by the transmitter to the antenna and the e.i.r.p. in order to reduce the risk of interference to passive sensors to the minimum.

872 In assigning frequencies to stations in the fixed-satellite service in the direction (space-to-Earth), administrations are requested to limit as far as practicable the power flux-density at the Earth's surface in the band 18.6—18.8 GHz, in order to reduce the risk of interference to passive sensors in the earth exploration-satellite and space research services.

873 Additional allocation: in Afghanistan, Algeria, Angola, Saudi Arabia, Bahrain, Bangladesh, Brazil, Brunei Darussalam, Cameroon, China, the Congo, the Republic of Korea, Costa Rica, Egypt, the United Arab Emirates, Gabon, Guatemala, Guinea, India, Indonesia, Iran, Iraq, Israel, Japan, Jordan, Kenya, Kuwait, Lebanon, Malaysia, Mali, Morocco, Mauritania, Nepal, Niger, Nigeria, Oman, Pakistan, the Philippines, Qatar, Syria, Singapore, Somalia, Sudan, Sri Lanka, Tanzania, Chad, Thailand, Togo, Tunisia, and Zaire, the band 19.7–21.2 GHz is also allocated to the fixed and mobile services on a primary basis. This additional use shall not impose any limitation on the power flux-density of space stations in the fixed-satellite service in the band 19.7–21.2 GHz and of space stations in the mobile-satellite service in the band 19.7–20.2 GHz where such allocation to the mobile-satellite service is on a primary basis in the latter band.

873A In order to facilitate interregional coordination between networks in the mobile-satellite and fixed-satellite services, carriers in the mobile-satellite service that are most susceptible to interference shall, to the extent practicable, be located in the higher parts of the bands 19.7–20.2 GHz and 29.5–30 GHz.

873B In the bands 19.7–20.2 GHz and 29.5–30 GHz in Region 2, and in the bands 20.1–20.2 GHz and 29.9–30 GHz in Regions 1 and 3, networks which are both in the fixed-satellite service and in the mobile-satellite service may include links between earth stations at specified or unspecified points or while in motion, through one or more satellites for point-to-point and point-to-multipoint communications.

873C In the bands 19.7–20.2 GHz and 29.5–30 GHz, the provisions of No. 953 do not apply with respect to the mobile-satellite service.

873D The allocation to the mobile-satellite service is intended for use by networks which use narrow spot-beam antennas and other advanced technology at the space stations. Administrations operating systems in the mobile-satellite service in the band 19.7–20.1 GHz in Region 2 and in the band 20.1–20.2 GHz shall take all practicable steps to ensure the continued availability of these bands for administrations operating fixed and mobile systems in accordance with the provisions of No. 873.

873E The use of the bands 19.7–20.1 GHz and 29.5–29.9 GHz by the mobile-satellite service in Region 2 is limited to satellite networks which are both in the fixed-satellite service and in the mobile-satellite service as described in No. 873B.

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 of interference to the radio astronomy service (see also 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—22.5 GHz. Emissions from space or airborne stations can be particularly serious sources of interference to the radio astronomy service (see also Nos. 343 and 344 and Article 36).

876 The use of the band 22.21—22.5 GHz by the earth exploration-satellite (passive) and space research (passive) services shall not impose constraints upon the fixed and mobile, except aeronautical mobile services.

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.

881 The band 24—24.25 GHz (centre frequency 24.125 GHz) is designated for industrial, scientific and medical (ISM) applications. Radiocommunication services operating within this band must accept harmful interference which may be caused by these applications. ISM equipment operating in this band is subject to the provisions of No. 1815.

881A—Use of the 25.25–27.5 GHz band by the inter-satellite service is limited to space research and Earth exploration-satellite applications, and also transmissions of data originating from industrial and medical activities in space.

881B—Space services using non-geostationary satellites operating in the inter-satellite service in the band 27–27.5 GHz are exempt from the provisions of No. 2613.

882 The band 29.95—30 GHz may be used for space-to-space links in the earth exploration-satellite service for telemetry, tracking, and control purposes, on a secondary basis.

882A Additional allocation: the bands 27.500–27.501 GHz and 29.999–30.000 GHz are also allocated to the fixed-satellite service (space-to-Earth) on a primary basis for the beacon transmissions intended for up link power control.

Such space-to-Earth transmissions shall not exceed an equivalent isotropically radiated power (e.i.r.p.) of +10 dBW in the direction of adjacent satellites on the geostationary-satellite orbit. In the band 27.500–27.501 GHz, such space-to-Earth transmissions shall not produce a power flux-density in excess of the values specified in No. 2578 on the Earth's surface.

882B Additional allocation: the band 27.501–29.999 GHz is also allocated to the fixed-satellite service (space-to-Earth) on a secondary basis for beacon transmissions intended for up link power control.

882C In the band 28.5–30 GHz, the earth exploration-satellite service is limited to the transfer of data between stations and not to the primary collection of information by means of active or passive sensors.

882D The band 27.5–30 GHz may be used by the fixed-satellite service (Earth-to-space) for the provision of feeder links for the broadcasting-satellite service.

882E—The inter-satellite service shall not claim protection from harmful interference from airport surface detection equipment stations of the radionavigation service.

882F—Additional allocation: in Japan, the band 24.65–25.25 GHz is also allocated to the radionavigation service on a primary basis until 2008.

882G—In the band 24.75–25.25 GHz, feeder links to stations of the broadcasting-satellite service shall have priority over other users in the fixed-satellite service (Earth-to-space). Such other users shall protect and shall not claim protection from existing and

future operating feeder-link networks to such broadcasting satellite stations.

883 Additional allocation: in Afghanistan, Algeria, Saudi Arabia, Bahrain, Bangladesh, Brunei Darussalam, Cameroon, China, the Congo, the Republic of Korea, Egypt, the United Arab Emirates, Ethiopia, Guinea, India, Indonesia, Iran, Iraq, Israel, Japan, Jordan, Kenya, Kuwait, Lebanon, Malaysia, Mali, Morocco, Mauritania, Nepal, Niger, Pakistan, Qatar, Syria, Singapore, Somalia, Sudan, Sri Lanka, Chad, and Thailand, the band 29.5–31 GHz is also allocated to the fixed and mobile services on a secondary basis. The power limits specified in Nos. 2505 and 2508 shall apply.

884 In the band 31–31.3 GHz the power flux-density limits specified in No. 2582 shall apply to the space research service.

885 *Different category of service:* In Bulgaria, Cuba, Hungary, Mongolia, Poland, the German Democratic Republic, Czechoslovakia and the U.S.S.R., the allocation of the band 31—31.3 GHz to the space research service is on a primary basis (see No. 425).

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, Roumania, 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).

892 Subject to agreement obtained under the procedure set forth in Article 14, the band 31.8—33.8 GHz may also be used in Japan for space-to-Earth transmissions in the fixed-satellite service up to 31 December 1990.

893 In designing systems for the inter-satellite and radionavigation services in the band 32—33 GHz, administrations shall take all necessary measures to prevent harmful interference between these two services, bearing in mind the safety aspects of the radionavigation service (see Recommendation 707).

894 *Additional allocation:* In Afghanistan, Saudi Arabia, Bahrain, Bangladesh, Egypt, the United Arab Emirates, Spain, Finland, Gabon, Guinea, Indonesia, Iran, Iraq, Israel, Kenya, Kuwait, Lebanon, Libya, Malaysia, Malawi, Mali, Malta, Morocco, Mauritania, Nepal, Niger, Nigeria, Oman, Pakistan, the Philippines, Qatar, Syria, Senegal, Singapore, Somalia, Sudan, Sri Lanka, Sweden, Tanzania, Thailand, Togo, Tunisia, Yemen A.R. and Zaire, the band 33.4—36 GHz is also allocated to the fixed and mobile services on a primary basis.

895 *Different category of service:* In Australia, Spain and the United States, the allocation of the band 34.2—34.7 GHz to the space research (deep space) (Earth-to-space) service is on a primary basis (see No. 425).

896 *Different category of service:* In Bulgaria, Cuba, Hungary, Poland, Mongolia, the German Democratic Republic, Czechoslovakia and the U.S.S.R., the allocation of the band 34.2—35.2 GHz to the space research service is on a primary basis (see No. 425).

897 Radars located on spacecraft may be operated on a primary basis in the band 35.5—35.6 GHz.

898 In making assignments to stations of other services, administrations are urged to take all practicable steps to protect the spectral line observations of 36.43—36.5 GHz from harmful interference. Emission 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).

899 Subject to agreement obtained under the procedure set forth in Article 14, the band 37—39 GHz may also be used in Japan for Earth-to-space transmissions in the fixed-satellite service up to 31 December 1990.

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 the radio astronomy service from harmful interference, especially in the bands 42.77—4287 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 souces of interference to the radio astronomy service (see Nos. 343 and 344 and Article 36).

901 The allocation of the spectrum for the fixed-satellite service in the bands 42.5—43.5 GHz and 47.2—50.2 GHz for Earth-to-space transmission is greater than that in the band 37.5—39.5 GHz for space-to-Earth transmission in order to accommodate feeder links to broadcasting satellites. Administrations are urged to take all practicable steps to reserve the band 47.2—49.2 GHz for feeder

links for the broadcasting-satellite service operating in the band 40.5—42.5 GHz.

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 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 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.

908 *Additional allocation:* In the Federal Republic of Germany, Japan and the United Kingdom, the band 54.25—58.2 GHz is also allocated to the radiolocation service on a primary basis.

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).

910 In the bands 59—64 GHz and 126—134 GHz, airborne radars in the radiolocation service may be operated subject to not causing harmful interference to the inter-satellite service (see No. 435).

911 The band 61—61.5 GHz (centre frequency 61.25 GHz) is designated for industrial, scientific and medical (ISM) applications. The use of this frequency band for ISM applications shall be subject to special authorization by the administrations concerned in agreement with other administrations whose radiocommunication services might be affected, In applying this provision administrations shall have due regard to the latest CCIR Recommendations.

912 In the band 78—79 GHz, radars located on space stations may be operated on a primary basis in the earth exploration-satellite service and in the space research service.

913 In the band 84—86 GHz, stations in the fixed, mobile and broadcasting services shall not cause harmful interference to broadcasting-satellite stations operating in accordance with the decisions of the appropriate frequency assignment planning conference for the broadcasting-satellite service.

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 the 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 (centre frequency 122.5 GHz) is designated 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 CCIR Recommendations.

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

918 The band 140.69—140.98 GHz, 144.68—144.98 GHz, 145.45—145.75 GHz 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 (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 observation. 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).

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 those under the provisions of No. 920.

922 The band 244—246 GHz (centre frequency 245 GHz) is designated 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 CCIR Recommendations.

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 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, 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, 344 and Article 36).

925 In the Federal Republic of Germany, Agentina, Spain, France, Finland, 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, 344 and Article 36).

927 The frequency band 275 GHz—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:

(a) Radio astronomy service: 278—280 GHz and 343—348 GHz.

(b) 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.

UNITED STATES (US) FOOTNOTES

(These footnotes, each consisting of the letters US followed by one or more digits, denote stipulations applicable to both Government and non-Government stations.)

US7—In the band 420–450 MHz and within the following areas, the peak envelope power output of a transmitter employed in the amateur service shall not exceed 50 watts, unless expressly authorized by the Commission after mutual agreement, on a case-by-case basis, between the Federal Communications Commission Engineer in Charge at the applicable district office and the military area frequency coordinator at the applicable military base. For areas (e) thru (j), the appropriate military coordinator is located at Peterson AFB, CO.

(a) Those portions of Texas and New Mexico bounded on the south by latitude 31°45′ North, on the east by 104°00′ West, on the north by latitude 34°30′ North, and on the west by longitude 107°30′ West;

(b) The entire State of Florida including the Key West area and the areas enclosed within a 200-mile radius of Patrick Air Force Base, Florida (latitude 28°21′ North, longitude 80°43′ West), and within a 200-mile radius of Eglin Air Force Base, Florida (latitude 30°30′ North, longitude 86°30′ West);

(c) The entire State of Arizona;

(d) Those portions of California and Nevada south of latitude 37°10′ North, and the areas enclosed within a 200 mile radius of the Pacific Missile Test Center, Point Mugu, California (latitude 34°09′ North, longitude 119°11′ West);

(e) In the State of Massachusetts within a 160-kilometer (100 mile) radius around locations at Otis Air Force Base, Massachusetts (latitude 41°45′ North, longitude 70°32′ West);

(f) In the State of California within a 240-kilometer (150 mile) radius around locations at Beale Air Force Base, California (latitude 39°08′ North, longitude 121°26′ West);

(g) In the State of Alaska within a 160 kilometer (100 mile) radius of Clear, Alaska (latitude 64 degrees, 17 north, longitude 149 degrees 10 west).

(h) In the State of North Dakota within a 160 kilometer (100 mile) radius of Concrete, North Dakota (latitude 48 degrees 43 north, longitude 97 degrees 54 west).

(i) In the States of Alabama, Florida, Georgia and South Carolina within a 200 kilometer (124 mile) radius of Warner Robins Air Force Base, Georgia (latitude 32°38 North, longitude 83°35 West).

(j) In the State of Texas within a 200 kilometer (124 mile) radius of Goodfellow Air Force Base, Texas (latitude 31°25 North, longitude 100°24 West).

US8 The use of the frequencies 170.475, 171.425, 171.575, and 172.275 MHz east of the Mississippi River, and 170.425, 170.575, 171.475, 172.225 and 172.375 MHz west of the Mississippi River may be authorized to fixed, land and mobile stations operated by non-Federal forest firefighting agencies. In addition, land stations and mobile stations operated by non-Federal conservation agencies, for mobile relay operation only, may be authorized to use the frequency 172.275 MHz east of the Mississippi River and the frequency 171.475 MHz west of the Mississippi River. The use of any of the foregoing nine frequencies shall be on the condition that no harmful interference will be caused to Government stations.

US10 The use of the frequencies 26.62, 143.75, 143.90 and 148.15 MHz may be authorized to Civil Air Patrol land stations and Civil Air Patrol mobile stations.

US11 The use of the frequencies 166.250 and 170.150 MHz may be authorized to non-Government remote pickup broadcast base and land mobile stations and to non-Government base, fixed and land mobile stations in the public safety radio services (the sum of the bandwidth of emission and tolerance is not to exceed 25 kHz, except that authorizations in existence as of December 20, 1974, using a larger bandwidth are permitted to continue in operation until December 20, 1979) in the continental United States (excluding Alaska) only, except within the area bounded on the west by the Mississippi River, on the north by the parallel of latitude 37°30′ N., and on the east and south by that arc of the circle with center at Springfield, Illinois, and radius equal to the airline distance between Springfield, Illinois, and Montgomery, Alabama, subtended between the foregoing west and north boundaries, on the condition that harmful interference will not be caused to Government stations persent or future in the Government band 162–174 MHz. The use of these frequencies by remote pickup broadcast stations will not be authorized for locations within 150 miles of New York City; and use of these frequencies by the public safety radio services will not be authorized except for locations within 150 miles of New York City.

US13 For the specific purpose of transmitting hydrological and meteorological data in co-operation 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	
169.425	171.125
169.450	171.825
169.475	171.850
169.500	171.875
169.525	171.900
170.225	171.925
170.250	406.125
170.275	406.175
170.300	409.675
170.325	409.725
171.025	412.625
171.050	412.675
171.075	412.725
171.100	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.

US14 When 500 kHz is being used for distress purposes, ship and coast stations using morse telegraph may use 512 kHz for calling.

US18 Navigation aids in the US and possessions in the bands 9–14 kHz, 90–110 kHz, 190–415 kHz, 510–535 kHz, 2700–2900 MHz are normally operated by the U.S. Government. However, authorizations may be made by the FCC for non-Government operation in these bands subject to the conclusion of appropriate arrangements between the FCC and the Government agencies concerned and upon special showing of need for service which the Government is not yet prepared to render.

US25 The use of frequencies in the band 25.85–26.1 MHz may be authorized in any area to non-Government remote pickup broadcast base and mobile stations on the condition that harmful interference is not caused to stations in the broadcasting service.

US26 The bands 117.975–121.4125 MHz, 123.5875–128.8125 MHz and 132.0125–136.0 MHz are for air traffic control communications.

US28 The band 121.5875–121.9375 MHz is for use by aeronautical utility land and mobile stations, and for air traffic control communications.

US30 The band 121.9375–123.0875 MHz is available to FAA aircraft for communications pursuant to flight inspection functions in accordance with the Federal Aviation Act of 1958.

US31 Except as provided below the band 121.9375–123.0875 MHz is for use by private aircraft stations.

The frequencies 122.700, 122.725, 122.750, 122.800, 122.950, 122.975, 123.000, 123.050 and 123.075 MHz may be assigned to aeronautical advisory stations. In addition, at landing areas having a part-time or no airdrome control tower or FAA flight service station, these frequencies may be assigned on a secondary non-interference basis to aeronautical utility mobile stations, and may be used by FAA ground vehicles for safety related communications during inspections conducted at such landing areas.

The frequencies 122.850, 122.900 and 122.925 MHz may be assigned to aeronautical multicom stations. In addition, 122.850 MHz may be assigned on a secondary noninterference basis to aeronautical utility mobile stations. In case of 122.925 MHz, US213 applies.

Air carrier aircraft stations may use 122.000 and 122.050 MHz for communication with aeronautical stations of the Federal Aviation Administration and 122.700, 122.800, 122.900 and 123.000 MHz for communications with aeronautical stations pertaining to safety of flight with and in the vicinity of landing areas not served by a control tower.

Frequencies in the band 121.9375–122.6875 MHz may be used by aeronautical stations of the Federal Aviation Administration for communication with private aircraft stations only, except that 122.000 and 122.050 MHz may also be used for communication with air carrier aircraft stations concerning weather information.

US32 Except for the frequencies 123.3 and 123.5 MHz, which are not authorized for Government use, the band 123.1125–123.5875 MHz is available for FAA communications incident to flight test and inspection activities pertinent to aircraft and facility certification on a secondary noninterference basis.

US33 The band 123.1125–123.5875 MHz is for use by flight test and aviation instructional stations. The frequency 121.950 MHz is available for aviation instructional stations.

US41 The Government radiolocation service is permitted in the band 2450–2500 MHz on condition that harmful interference is not caused to non-Government services.

US44 The non-Government radiolocation service may be authorized in the band 2900–3100 MHz on the condition that no harmful interference is caused to Government services.

US48 The non-Government radiolocation service may be authorized in the bands 5350–5460 MHz and 9000–9200 MHz on the condition that it does not cause harmful interference to the aeronautical radionavigation service or to the Government radiolocation service.

US49 The non-Government radiolocation service may be authorized in the band 5460–5470 MHz on the condition that it does not cause harmful interference to the aeronautical or maritime radionavigation services or to the Government radiolocation service.

US50 The non-Government radiolocation service may be authorized in the band 5470–5600 MHz on the condition that it does not cause harmful interference to the maritime radionavigation service or to the Government radiolocation service.

US51 In the band 5600–5650 MHz and 9300–9500 MHz, the non-Government radiolocation service shall not cause harmful interference to the Government radiolocation service.

US53 In view of the fact that the band 13.25–13.4 GHz is allocated to doppler navigation aids, Government, and non-Government airborne doppler radars in the aeronautical radionavigation service are permitted in the band 8750–8850 MHz only on the condition that they must accept any interference that may be experienced from stations in the radiolocation service in the band 8500–10000 MHz.

US54 Temporarily, and until certain operations of the radiolocation service in the band 9000–9200 MHz can be transferred to other appropriate frequency bands, the aeronautical radionavigation service may, in certain geographical areas, be subject to receiving some degree of interference from the radiolocation service.

US58 In the band 10000–10500 MHz, pulsed emissions are prohibited, except for weather radars on board meteorological satellites in the band 10000–10025 MHz. The amateur service and the non-Government radiolocation service, which shall not cause harmful interference to the Government radiolocation service, are the only non-Government services permitted in this band. The non-Government radiolocation service is limited to survey operations as specified in footnote US108.

US59 The band 10.5–10.55 GHz is restricted to systems using type NON (AO) emission with a power not to exceed 40 watts into the antenna.

US65 The use of the band 5460–5650 MHz by the maritime radionavigation service is limited to shipborne radars.

US66 The use of the band 9300–9500 MHz by the aeronautical radionavigation service is limited to airborne radars and associated airborne beacons. In addition, ground-based radar beacons in the aeronautical radionavigation service are permitted in the band 9300–9320 MHz on the condition that harmful interference is not caused to the maritime radionavigation service.

US67 The use of the band 9300–9500 MHz by the meteorological aids service is limited to

ground-based radars. Radiolocation installations will be coordinated with the meteorological aids service and, insofar as practicable, will be adjusted to meet the requirements of the meteorological aids service.

US69 In the band 31.8–33.4 GHz, ground-based radionavigation aids are not permitted except where they operate in cooperation with airborne or shipborne radionavigation devices.

US70 The meteorological aids service allocation in the band 400.15–406.0 MHz does not preclude the operation therein of associated ground transmitters.

US71 In the band 9300–9320 MHz, low-powered maritime radionavigation stations shall be protected from harmful interference caused by the operation of land-based equipment.

US74 In the bands 25.55–25.67, 73.0–74.6, 406.1–410.0, 608–614, 1400–1427, 1660.5–1670.0, 2690–2700 and 4990–5000 MHz and in the bands 10.68–10.7, 15.35–15.4, 23.6–24.0, 31.3–31.5, 86–92, 105–116 and 217–231 GHz, the radio astronomy service shall be protected from extraband radiation only to the extent that 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.

US77 Government stations may also be authorized:

(a) Port operations use on a simplex basis by coast and ship stations of the frequencies 156.6 and 156.7 MHz;

(b) Duplex port operations use of the frequency 157.0 MHz for ship stations and 161.6 MHz for coast stations;

(c) Inter-ship use of 156.3 MHz on a simplex basis; and

(d) Vessel traffic services under the control of the U.S. Coast Guard on a simplex basis by coast and ship stations on the frequencies 156.25, 156.55, 156.6 and 156.7 MHz.

(e) Navigational bridge-to-bridge and navigational communications on a simplex basis by coast and ship stations on the frequencies 156.375 and 156.65 MHz.

US78 In the mobile service, the frequencies between 1435 and 1535 MHz will be assigned for aeronautical telemetry and associated telecommand operations for flight testing of manned or unmanned aircraft and missiles, or their major components. Permissible usage includes telemetry associated with launching and reentry into the earth's atmosphere as well as any incidental orbiting prior to reentry of manned objects undergoing flight tests. The following frequencies are shared with flight telemetry mobile stations: 1444.5, 1453.5, 1501.5, 1515.5, 1535.5 and 1525.5 MHz.

US80 Government stations may use the frequency 122.9 MHz subject to the following conditions:

(a) All operations by Government stations shall be restricted to the purpose for which the frequency is authorized to non-Government stations, and shall be in accordance with the appropriate provisions of the Commission's Rules and Regulations, Part 87, Aviation Services;

(b) Use of the frequency is required for coordination of activities with Commission licensees operating on this frequency; and

(c) Government stations will not be authorized for operation at fixed locations.

US81 The band 38.0—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 38.0—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 observations. 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 Engineer, Federal Communications Commission, Washington, D.C. 20554.

US82 Until July 1, 1991, the assignable frequencies in the bands 4143.6–4146.6 kHz, 6218.6–6224.6 kHz, 8291.1–8297.3 kHz, 12429.2–12439.5 kHz, 16587.1–16596.4 kHz and 22124–22139.5 kHz may be authorized on a shared nonpriority basis to Government and non-Government ship and coast stations (SSB telephony, with peak envelope power not to exceed 1 kW). Effective July 1, 1991, the assignable frequencies in the bands 4146–4152 kHz, 6224–6233 kHz, 8294–8300 kHz, 12353–12368 kHz, 16528–16549 kHz, 18825–18846 kHz, 22159–22180 kHz, and 25100–25121 kHz may be authorized on a shared non-priority basis to Government and non-Government ship and coast stations (SSB telephony, with peak envelope power not to exceed 1 kW).

US87 The frequency 450 MHz, with maximum emission bandwidth of 500 kHz, may be used by Government and non-Government stations for space telecommand at specific locations, subject to such conditions as may be applied on a case-by-case basis.

US90 In the band 2025—2110 MHz earth-to-space and space-to-space transmissions may be authorized in the space research and earth exploration-satellite services subject to such conditions as may be applied on a case-by-case basis. Such transmissions shall not

cause harmful interference to non-Government stations operating in accordance with the Table of Frequency Allocations. All space-to-space transmissions reaching the earth's surface shall adhere to a power flux density of between −144 and −154 (dbw/(m^2)/4 kHz depending on the angle of arrival per ITU Radio Regulation 2557 and shall not cause harmful interference to the other space services.

US93 In the conterminous United States, the frequency 108.0 MHz may be authorized for use by VOR test facilities, the operation of which is not essential for the safety of life or property, subject to the condition that no interference is caused to the reception of FM broadcasting stations operating in the band 88—108 MHz. In the event that such interference does occur, the licensee or other agency authorized to operate the facility shall discontinue operation on 108 MHz and shall not resume operation until the interference has been eliminated or the complaint otherwise satisfied. VOR test facilities operating on 108 MHz will not be protected against interference caused by FM broadcasting stations operating in the band 88—108 MHz not shall the authorization of a VOR test facility on 108 MHz preclude the Commission from authorizing additional FM broadcasting stations.

US99 In the band 1668.4—1670.0 MHz, the meteorological aids service (radiosonde) will avoid operations to the maximum extent practicable. 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 Management Unit, National Science Foundation, Washington, D.C. 20550.

US102 In Alaska only, the frequency 122.1 MHz may also be used for air carrier air traffic control purposes at locations where other frequencies are not available to air carrier aircraft stations for air traffic control.

US104 The LORAN Radionavigation System has priority in band 90—110 kHz in the United States and possessions. Radiolocation land stations making use of LORAN type equipment may be authorized to both Government and non-Government on a secondary service basis for offshore radiolocation activities only at specific locations and subject to such technical and operational conditions (e.g., power, emission, pulse rate and phase code, hours of operation), including on-the-air testing, as may be required on a case-by-case basis to ensure protection of the LORAN radionavigation system from harmful interference and to ensure mutual compability among radiolocation operators. Such authorizations to stations in the radiolocation service are further subject to showing of need for service which is not currently provided and which the Government is not yet prepared to render by way of the radionavigation service.

US106 The frequency 156.75 MHz is available for assignment to non-Government and Government stations for environmental communications in accordance with an agreed plan.

US107 The frequency 156.8 MHz is the national distress, safety and calling frequency for the maritime mobile VHF radiotelephone service for use by Government and non-Government ship and coast stations. Guard bands of 156.7625—156.7875 and 156.8125—156.8375 MHz are maintained.

US108 Within the bands 3300—3500 MHz and 10000—10500 MHz, survey operations, using transmitters with a peak power not to exceed five watts into the antenna, may be authorized for Government and non-Government use on a secondary basis to other Government radiolocation operations.

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—36.0 GHz, the non-Government radiolocation service shall be secondary to the Government radioactive 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.

US111 In the band 1990—2120 MHz, Government space research earth stations may be authorized to use specific frequencies at specific locations for earth-to-space transmissions. Such authorizations shall be secondary to non-Government use of this band and subject to such other conditions as may be applied on a case-by-case basis.

Corpus Christi, Tex., 27°39′N., 097°23′W.
Fairbanks, Alaska, 64°59′N., 147°53′W.
Goldstone, Calif., 35°18′N., 116°54′W.
Greenbelt, Md., 39°00′N., 076°50′W.
Guam, Mariana Is., 13°19′N., 144°44′E.
Kauai, Hawaii, 22°08′N., 159°40′W.
Merritt Is., Fla., 28°29′N., 080°35′W.
Rosman, N.C., 35°12′N., 082°52′W.
Wallops Is., Va., 37°57′N., 075°20′W.

US112 The frequency 123.1 MHz is for search and rescue communications. This frequency may be assigned for air traffic control communications at special aeronautical events on the condition that no harmful interference is caused to search and rescue communications during any period of search and rescue operations in the licale involved.

US116 In the bands 890–902 MHz and 935–941 MHz, no new assignments are to be made to Government radio stations after July 10, 1970 except on case-by-case basis, to experimental stations and to additional stations of existing networks in Alaska. Government assignments existing prior to July 10 1970 to stations in Alaska may be continued. All other existing Government assignments

shall be on a secondary basis to stations in the non-Government land mobile service and shall be subject to adjustment or removal from the bands 890–902 MHz, 928–932 MHz and 935–941 MHz at the request of the FCC.

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 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 longitudes 117°40′W. and 118°30′W. and the second between latitudes 37°N. and 38°N. and longitudes 118°W. and 118°50′W.

Sagamore Hill Radio Observatory:

Rectangle between latitudes 42°10′N. and 43°00′N. and longitudes 70°31′W. and 71°31′W.

Table Mountain Solar Observatory (NOAA), Boulder, Colorado (407–409 MHz only):

Rectangle between latitudes 39°30′N. and 40°30′N. and longitudes 104°30′W. and 106°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.

US201 In the band 460–470 MHz, space stations in the earth exploration-satellite service may be authorized for space-to-earth transmissions on a secondary basis with respect to the fixed and mobile services. When operating in the meteorological-satellite service, such stations shall be protected from harmful interference from other applications of the earth exploration-satellite service. The power flux produced at the earth's surface by any space station in this band shall not exceed −152 dBW/m²/4 kHz.

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

4 GHz	14 GHz	Observatory
X	.....	National Astronomy and Ionosphere Center, Arecibo, Puerto Rico.
X	X	National Radio Astronomy Observatory, Green Bank, W. Va.

BANDS TO BE OBSERVED—Continued

4 GHz	14 GHz	Observatory
X	X	National Radio Astronomy Observatory, Socorro, New Mexico.
X	X	Hat Creek Observatory (U of Calif.), Hat Creek, Cal.
X	X	Haystack Radio Observatory (MIT-Lincoln Lab), Tyngsboro, Mass.
X	X	Owens Vally Radio Observatory (Cal. Tech.), Big Pine, Cal.
.....	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.

US209 The use of frequencies 460.6625, 460.6875, 460.7125, 460.7375, 460.7625, 460.7875, 460.8125, 460.8375, 460.8625, 465.6625, 465.6875, 465.7125, 465.7375, 465.7625, 465.7875, 465.8125, 465.8375, and 465.8625 MHz may be authorized, with 100 mW or less output power, to Government and non-Government radio stations for one-way, non-voice bio-medical telemetry operations in hospitals, or medical or convalescent centers.

US210 Use of frequencies in the bands 40.66–40.70 and 216–220 MHz may be authorized to Government and non-Government stations on a secondary basis for the tracking of, and telemetering of scientific data from, ocean buoys and wildlife. Airborne wildlife telemetry in the 216–220 MHz band will be limited to the 216.0–216.1 MHz portion of the band. Operation in these two bands is subject to the technical standards specified in: (a) Section 8.2.42 of the NTIA Manual for Government use, or (b) Section 5.108 of the Commission's Rules for non-Government use.

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, 31.8–32.0, 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 lands from harmful interference; however, US74 applies.

US212 In the State of Alaska, the carrier frequency 5167.5 kHz (assigned frequency 5168.9 kHz) is designated for emergency communications. This frequency may also be

used in the Alaska-Private Fixed Service for calling and listening, but only for establishing communications before switching to another frequency. The maximum power is limited to 150 watts peak envelope power (PEP).

US213 The frequency 122.925 MHz is for use only for communications with or between aircraft when coordinating natural resources programs of Federal or State natural resources, agencies, including forestry management and fire suppression, fish and game management and protection and environmental monitoring and protection.

US214 The frequency 157.1 MHz is the primary frequency for liaison communications between ship stations and stations of the United States Coast Guard.

US215 Emissions from microwave ovens manufactured on and after January 1, 1980, for operation on the frequency 915 MHz must be confined within the band 902–928 MHz. Emissions from microwave ovens manufactured prior to January 1, 1980, for operation on the frequency 915 MHz must be confined within the band 902–940 MHz. Radiocommunications services operating in the band 928–940 MHz must accept any harmful interference from the operation of microwave ovens manufactured before January 1, 1980.

US216 The frequencies 150.775 and 150,790, and the bands 152–152.0150, 163.2375–163.2625, 462.9375–463.1875 and 467.9375–468.1875 MHz are authorized for Governmelt/non-Governmelt operations in medical radio commulications systems.

US217 Pulse-ranging radimlocation systems may be authorized for Governmelt and non-Government use in the 420–450 MHz band along the shorelines of Alaska and the contiguous 48 states. Spread spectrum radiolocation systems may be authorized in the 420–435 MHz portion of the band for operation within the contiguous 48 States and Alaska. Authorizations will be eranted on a case-by-case basis; howeter, operations proposed to be located within the zones set forth in US228 should not expect tm be accommodated. All stations operating in accordance with this provision will be secondary to stations operating in accordance with the Table of Frequency Allocations.

US218 The band 902–928 MHz is available for Location and Monitoring Service (LMS) systems subject to not causing harmful interference to the operation of all Government stations authorized in these bands. These systems must tolerate interference from the operation of industrial, scientific, and medical (ISM) devices and the operation of Government stations authorized in these bands.

US219 In the band 2025–2110 MHz Government Earth resources satellite Earth stations in the Earth exploration-satellite service may be authorized to use the frequency 2106.4 MHz for Earth-to-space transmission for tracking, telemetry, and telecommand at the sites listed below. Such transmissions shall not cause harmful interference to non-Government operations:

Sioux Falls, South Dakota, 43°32′03.1″ N., 96°45′42.8″ W.

Fairbanks, Alaska, 64°58′36.6″ N., 147°30′54.2″ W.

US220 The frequencies 36.25 and 41.71 MHz may be authorized to Government stations and non-Government stations in the petroleum radio service, for oil spill containment and cleanup operations. The use of these frequencies for oil spill containment or cleanup operations is limited to the inland and coastal waterway regions.

US221 In the 525–535 kHz band, the mobile service is limited to distribution of public service information from Travelers Information Stations operating on 530 kHz.

US222 In the band 2025–2035 MHz geostationary operational environmental satellite Earth stations in the space research and Earth exploration-satellite services may be authorized on a coequal basis for Earth-to-space transmissions for tracking, telemetry, and telecommand at the sites listed below:

Wallops Is., Va. 37°50′48″ N., 75°27′33″ W.
Seattle, Wash. 47°34′15″ N., 122°33′10″ W.
Honolulu, Hawaii 21°21′12″N., 157°52′36″W.

US223 Within 75 miles of the United States/Canada border on the Great Lakes, the St. Lawrence Seaway, and the Puget Sound and the Strait of Juan de Fuca and its approaches, use of coast transmit frequency 162.025 MHz and ship station transmit frequency 157.425 MHz (VHF maritime mobile service Channel 88) may be authorized for use by the maritime service for public correspondence.

US224 Government systems utilizing spread spectrum techniques for terrestrial communication, navigation and identification may be authorized to operate in the band 960–1215 MHz on the condition that harmful interference will not be caused to the aeronautical radionavigation service. These systems will be handled on a case-by-case basis. Such systems shall be subject to a review at the national level for operational requirements and electromagnetic compatibility prior to development, procurement or modification.

US225 In addition to its present Government use, the frequency band 510–525 kHz is available to Government and non-Government aeronautical radionavigation stations inland of the Territorial Base Line as coordinated with the military services. In addition, the frequency 510 kHz is available for non-Government ship-helicopter operations when beyond 100 nautical miles from shore and required for aeronautical radionavigation.

US226 In the State of Hawaii, stations in the aeronautical radionavigation service

shall not cause harmful interference to U.S. Navy reception from its station at Honolulu on 198 kHz.

US228 Applicants for operation in the band 420 to 450 MHz under the provisions of US217 should not expect to be accommodated if their area of service is within the following geographic areas:

(a) Those portions of Texas and New Mexico bounded on the south by latitude 31°45° North, on the east by longitude 104°00 West, on the north by latitude 34°30° North, and on the West by longitude 107°30 West.

(b) In the State of Massachusetts within a 160 kilometers (100 miles) radius around the locations of Otis Air Force Base, Massachusetts (latitude 41°45′ North, longitude 70°32′ West).

(c) In the State of California within a 240 kilometer (150 mile) radius of Beale Air Force Base, California (latitude 39°08′ North, longitude 121°26′ West).

(d) In the State of Alaska, within a 160 kilometer (100 mile) radius of Clear, Alaska (latitude 64°17′ North, longitude 149°10′ West).

(e) In the State of North Dakota, within a 160 kilometer (100 mile) radius of Concrete, North Dakota (latitude 48°43′ North, longitude 97°54′ West).

(f) Those portions of Texas and New Mexico bounded on the south by latitude 31°45′ North, on the east by longitude 104°100′ West, on the north by latitude 34°30′ North, and on the West by longitude 107°30′ West.

(g) In the state of Alaska within a 160 kilometer (100 mile) radius of Clear, Alaska (latitude 64 degrees 17 north, longitude 149 degrees 10 west).

(h) In the state of North Dakota within a 160 kilometer (100 mile) radius of Concrete, North Dakota (latitude 48 degrees 43 north, longitude 97 degrees 54 west).

(i) In the States of Alabama, Florida, Georgia and South Carolina within a 200 kilometer (124 mile) radius of Warner Robins Air Force Base, Georgia (latitude 32°38 North, longitude 83°35 West).

(j) In the State of Texas within a 200 kilometer (124 mile) radius of Goodfellow Air Force Base, Texas (latitude 31°25 North, longitude 100°24 West).

US229 Assignments to stations in the fixed and mobile services may be made on the condition that no harmful interference is caused to the Navy SPASUR system currently operating in the southern United States in the frequency band 216.88–217.08 MHz.

US230 Non-government land mobile service is allocated on a primary basis in the bands 422.1875—425.4875 and 427.1875—429.9875 MHz within 50 statute miles of Detroit, MI, and Cleveland, OH, and in the bands 423.8125—425.4875 and 428.8125—429.9875 MHz within 50 statute miles of Buffalo, NY.

US231 When an assignment cannot be obtained in the bands between 200 and 525 kHz, which are allocated to aeronautical radionavigation, assignments may be made to aeronautical radiobeacons in the maritime mobile band 435–490 kHz, on a secondary basis, subject to the coordination and agreement of those agencies having assignments within the maritime mobile band which may be affected. Assignments to aeronautical radionavigation radiobeacons in the band 435–490 kHz shall not be a bar to any required changes to the maritime mobile radio service and shall be limited to Government not employing voice emissions.

US235 Until implementation procedures and schedules are determined by future conferences of the International Telecommunications Union, the bands 9775–9900 kHz, 11650–11700 kHz, 11975–12050 kHz, 13600–13800 kHz, 15450–15600 kHz, 17550–17700 kHz, and 21750–21850 kHz to be implemented by the broadcasting service are allocated as an alternative allocation to the fixed service. The bands 12230–12330 kHz, 16360–16460 kHz, 17360–17410 kHz, 18780–18900 kHz, 19680–19800 kHz, 22720–22855 kHz, 25110–25210 kHz, and 26100–26175 kHz to be implemented by the maritime mobile service are also allocated as an alternative allocation to the fixed service until July 1, 1991, when these bands are to be allocated exclusively to the maritime mobile service.

US236 Until implementation procedures and schedules are determined by future conferences of the International Telecommunications Union (See Resolution 319), the bands 4000–4063 and 8100–8195 kHz are also allocated on a primary basis to the fixed service.

US238 The 1605–1705 kHz band is allocated to the radiolocation service on a secondary basis.

US239 Aeronautical radionavigation stations (radiobeacons) may be authorized, primarily for off-shore use, in the band 525–535 kHz on a non-interference basis to travelers information stations.

US240 The bands 1715–1725 and 1740–1750 kHz are allocated on a primary basis and the bands 1705–1715 kHz and 1725–1740 kHz on a secondary basis to the aeronautical radionavigation service, (radiobeacons).

US244 The band 136.000–137.000 MHz is allocated to the non-Government aeronautical mobile (R) service on a primary basis, and is subject to pertinent international treaties and agreements. The frequencies 136.000 MHz, 136.025 MHz, 136.050 MHz, 136.075 MHz, 136.125 MHz, 136.150 MHz, 136.175 MHz, 136.225 MHz, 136.250 MHz, 136.300 MHz, 136.325 MHz, 136.350 MHz, 136.400 MHz, 136.425 MHz and 136.450 MHz are available on a shared basis to the Federal Aviation Administration for air traffic control purposes, such as automatic weather observation services (AWOS), automatic terminal information services (ATIS) and airport control tower communications. Stations licensed prior to January 2, 1990,

using the 136–137 MHz band for space operation (space-to-earth), meteorological-satellite service (space-to-earth) and the space research service (space-to-earth) may continue to use this band on a secondary basis to aeronautical mobile (R) service stations. No new assignments will be made to stations in the above space services.

US245 The fixed-satellite service is limited to international inter-continental systems and subject to case-by-case electromagnetic compatibility analysis.

US246 No stations will be authorized to transmit in the bands 608–614 MHz, 1400–1427 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.

US247 The band 10100–10150 kHz is allocated to the fixed service on a primary basis outside the United States and possessions. Transmissions of stations in the amateur service shall not cause harmful interference to this fixed service use and stations in the amateur service shall make all necessary adjustments (including termination of transmission) if harmful interference is caused.

US251 The band 12.75–13.25 GHz is also allocated to the space research, (deep space) (space-to-earth) service for reception only at Goldstone, California. 35°18 N. 116°54 – W.

US252 The bands 2110–2120, 7145–7190 MHz, and 34.2–34.7 GHz are also allocated for earth-to-space transmissions in the space research service, limited to deep space communications at Goldstone, California.

US253 In the band 2300–2310 MHz, the fixed and mobile services shall not cause harmful interference to the amateur service.

US254 In the band 18.6–18.8 GHz the fixed and mobile services shall be limited to a maximum equivalent isotropically radiated power of +35 dBW and the power delivered to the antenna shall not exceed −3 dBW.

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/M² 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 in so far as it is practicable.

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.

Haystack Radio Observatory, Tyngsboro, Massachusetts
Rectangle between latitudes 41°00 N. and 43°00 N. and between longitudes 71°00 W. and 73°00 W.

National Radio Astronomy Observatory, Green Bank, West Virginia
Rectangle between latitudes 37°00 N. and 39°15 N. and longitudes 78°30 W. and 80°30 W.

National Radio Astronomy Observatory, Socorro, New Mexico
Rectangle between latitudes 32°30 N. and 35°30 N. and between longitudes 106°00 W. and 109°00 W.

Owens Valley Radio Observatory, Big Pine, California
Two contiguous rectangles, one between latitudes 36°00 N. and 37°00 N. and between longitudes 117°40 W. and 118°30 W. and the second between latitudes 37°00 N. and 38°00 N. and longitudes 118°00W and 118°50 W.

Hat Creek Observatory, Hat Creek, California
Rectangles between latitudes 40°00 N. and 42°00 N. and between longitudes 120°15 W. and 122°15 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 40°00 N. and 42°00 N. and between longitudes 120°15 W. and 122°15 W.

Owens Valley Radio Observatory, Pine, California
Two contiguous rectangles, Big one between latitudes 36°00 N. and 37°00 N. and longitudes 117°40 W. and 118°30 W. and the second between latitudes 37°00 N. and 38°00 N. and longitudes 118°00 W. and 118°50 W.

Haystack Radio Observatory, Tyngsboro, Massachusetts
Rectangle between latitudes 41°00 N. and 43°00 N. and between longitudes 71°00 W. and 73°00 W.

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. and 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 longitudes 78°30 W. and 80°30 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 tm the listed observatories. Should such assignments result in harmful interference to these observatories, the situation will be remedied to the extent practicable.

US258 In the band 8025–8400 MHz, the non-Government earth exploration-satellite service (space-to-earth) is allocated on a primary basis. Authorizations are subject to a case-by-case electromagnetic compatibility analysis.

US259 Stations in the radiolocation service in the band 17.3–17.7 GHz, shall be restricted to operating powers of less than 51 dBW eirp after feeder link stations for the broadcasting-satellite service are authorized and brought into use.

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.

US261 The use of the band 4200–4400 MHz by the aeronautical radionavigation service is reserved exclusively for airborne radio altimeters. Experimental stations will not be authorized to develop equipment for operational use in this band other than equipment related to altimeter stations. However, passive sensing in the earth-exploration satellite and space research services may be authorized in this band on a secondary basis (no protection is provided from the radio altimeters).

US262 The band 31.8–32.3 GHz is also allocated for space-to-earth transmissions in the space research service, limited to deep space communications at Goldstone, California.

US263 In the frequency bands 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 research and 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 isotropically radiated power of 40 dBW and the power delivered to the antenna shall not exceed −3dBW per 250 kHz.

US266 Licensees in the public safety radio services holding a valid authorization on June 30, 1958, to operate in the frequency band 156.27–157.47 MHz or on the frequencies 161.85, 161.91 or 161.97 MHz may, upon proper application, continue to be authorized for such operation, including expansion of existing systems, until such time as harmful interference is caused to the operation of any authorized station other than those licensed in the public safety radio service.

US267 In the band 902–928 MHz, amateur radio stations shall not operate within the States of Colorado and Wyoming, bounded by the area of: latitude 39°N. to 42°N. and longitude 103°W. to 108°W.

US268 The bands 890–902 MHz and 928–942 MHz are also allocated to the radiolocation service for Government ship stations (offshore ocean areas) on the condition that harmful interference is not caused to non-Government land mobile stations. The provisions of footnote US116 apply.

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 system through the Electromagnetic Management Unit, National Science Foundation, Washington, D.C. 20550, prior to system development.

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.

US271 The use of the band 17.3–17.8 GHz by the fixed-satellite service (earth-to-space) is limited to feeder links for broadcasting-satellite service.

US272 The allocation to the maritime mobile-satellite service in the band 1530–1535 MHz shall be effective from 1 January 1990. Up to that date the allocation to the mobile service will be on a primary basis.

US273 In the 74.6–74.8 MHz and 75.2–75.4 MHz bands stations in the fixed and mobile services are limited to a maximum power of 1 watt from the transmitter into the antenna transmission line.

US274 In the 216–220 MHz band fixed, aeronautical mobile and land mobile stations are limited to telemetering and associated telecommand operations.

US275 The band 902–928 MHz is allocated on a secondary basis to the amateur service subject to not causing harmful interference to the operations of Government stations authorized in this band or to Location and Monitoring Service (LMS) systems. Stations in the Amateur service must tolerate any interference from the operations of industrial, scientific, and medical (ISM) devices, LMS systems, and the operations of Government stations authorized in this band. Further, the Amateur Service is prohibited in those portions of Texas and New Mexico bounded on the south by latitude 31°41′ North, on the east by longitude 104°11′ West, and on the north by latitude 34°30′ North, and on the west by longitude 107°30′ West; in addition, outside this area but within 150 miles of

these boundaries of White Sands Missile Range the service is restricted to a maximum transmitter peak envelope power output of 50 watts.

US276 Except as otherwise provided for herein, use of the band 2310–2390 MHz by the mobile service is limited to aeronautical telemetering and associated telecommand operations for flight testing of manned or unmanned aircraft, missiles, or major components thereof. The following six frequencies are shared on a co-equal basis for telemetering and associated telecommand operations of expendable launch vehicles whether or not such operations involve flight testing: 2312.5, 2332.5, 2352.5, 2364.5, 2370.5 and 2382.5 MHz. All other mobile telemetering uses shall be secondary to the above uses.

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′08″N.; 79°49′42″W.) National Radio Astronomy Observatory, Socorro, New Mexico; (34°04′43″N.; 107°37′04″W.), Harvard Radio Astronomy Station, Fort Davis, Texas; (30°38′08″N.; 103°56′42″W.), Hat Creek Observatory, Hat Creek, California; (40°49′03″N.; 121°28′24″W.), Owens Valley Radio Observatory, Big Pine, California; (37°13′54″N.; 118°17′36″W.), Naval Research Laboratory, Maryland Point, Maryland (38°22′26″N.; 77°14′00″W.).

US278 In the 22.55–23.55 and 32–33 GHz bands non-geostationary intersatellite links may operate on a secondary basis to geostationary intersatellite links.

US279 The frequency 2182 kHz may be authorized to fixed stations associated with the maritime mobile service for the sole purpose of transmitting distress calls and distress traffic, and urgency and safety signals and messages.

US281 In the band 25.07–25.11 MHz non-Government stations in the industrial radio services shall not cause harmful interference to, and must accept interference from, stations in the maritime mobile service operating in accordance with the International Table of Frequency Allocations.

US282 In the band 4650–4700 kHz frequencies may be authorized for non-Government communication with helicopters in support of off-shore drilling operations on the condition that harmful interference will not be caused to services operating in accordance with the Table of Frequency Allocations.

US283 In the bands 2850–3025 kHz, 3400–3500 kHz, 4650–4700 kHz, 5450–5680 kHz, 6525–6685 kHz, 10005–10100 kHz, 11275–11400 kHz, 13260–13360 kHz and 17900–17970 kHz frequencies in these bands may be authorized for non-Government flight test purposes on the condition that harmful interference will not be caused to services operating in accordance with the Table of Frequency Allocations.

US284 Until July 1, 1991, the carrier frequencies 6451.9 and 6455.0 kHz may be authorized to non-Government ship telephone and coast telephone stations operating in the Mississippi River maritime mobile service system on the condition that harmful interference will not be caused to services operating in accordance with the Table of Frequency Allocations and that any interference from such services must be accepted.

US285 Under exceptional circumstances, the carrier frequency 2635, 2638, and 2738 kHz may be authorized to coast stations.

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.

US290 In the band 1900–2000 kHz amateur stations may continue to operate on a secondary basis to the radiolocation service, pending a decision as to their disposition through a future rule making proceeding in conjunction with the implementation of the standard broadcasting service in the 1625–1705 kHz band.

US291 Television pickup stations in the mobile service may be authorized to use frequencies in the band 38.6–40 GHz on a secondary basis to stations operating in accordance with the Table of Frequency Allocations.

US292 In the band 14.0–14.2 GHz stations in the radionavigation service shall operate on a secondary basis to the fixed-satellite service.

US294 In the spectrum below 490 kHz electric utilities operate Power Line Carrier (PLC) systems on power transmission lines for communications important to the reliability and security of electric service to the public. These PLC systems operate under the provisions of Part 15 of the Federal Communications Commission's Rules and Regulations or Chapter 7 of the National Telecommunications and Information Administration's Manual of Regulations and Procedures for Federal Radio Frequency Management, on an unprotected and noninterference basis with respect to authorized radio users. Notification of intent to place new or revised radio frequency assignments or PLC frequency uses in the bands below 490 kHz is to be made in accordance with the Rules and Regulations of the FCC and NTIA, and users are urged to minimize potential interference to the degree practicable. This footnote does not provide any allocation status to PLC radio frequency uses.

US296 Until July 1, 1991, in the bands designated for ship wide-band telegraphy, facsimile and special transmission systems, the

following assignable frequencies are available to non-Government stations on a shared basis with Government stations: 2070.5, 2072.5, 2074.5, 2076.5, 4160.6, 4168, 6238.6, 6242.6, 8326, 8341.5, 12485, 12489, 16654, 16658, 22186 and 22190 kHz. Effective July 1, 1991, in the bands designated for ship wide-band telegraphy, facsimile and special transmission systems, the following assignable frequencies are available to non-Government stations on a shared basis with Government stations: 2070.5, 2072.5, 2074.5, 2076.5, 4154.5, 4169.5, 6235.5, 6259.5, 8302.5, 8338.5, 12370.5, 12418.5, 16551.5, 16614.5, 18847.5, 18868.5, 22181.5, 22238.5, 25123.5, and 25159.5 kHz.

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.

US298 Channels 27555, 27615, 27635, 27655, 27765, and 27860 kHz are available to eligibles in the Forest Products Radio Service on a secondary basis to Government operations including experimental stations. Operations in the Forest Products Radio Service on these channels will not exceed 150 watts and are limited to the states of Washington, Oregon, Maine, North Carolina, South Carolina, Tennessee, Georgia, Florida, Alabama, Mississippi, Louisiana, and Texas (eastern portion).

US299 The 1615–1705 kHz band in Alaska is also allocated to the maritime mobile services and the Alaska fixed service on a secondary basis to Region 2 broadcast operations.

US300 The frequencies 169.445, 169.505, 170.245, 170.305, 171.045, 171.105, 171.845 and 171.905 MHz are available for wireless microphone operations on a secondary basis to Government and non-Government operations.

US301 Except as provided in US302, broadcast auxiliary stations licensed as of November 21, 1984, to operate in the band 942–944 MHz may continue to operate on a co-equal primary basis to other stations and services operating in the band in accordance with the Table of Frequency Allocations.

US302 The band 942–944 MHz in Puerto Rico is allocated as an alternative allocation to the fixed service for broadcast auxiliary stations only.

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/m²/4 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.

US307 The sub-band 5150–5216 MHz is also allocated for space-to-Earth transmissions in the fixed satellite service for feeder links in conjunction with the radiodetermination satellite service operating in the bands 1610–1626.5 MHz and 2483.5–2500 MHz. The total power flux density at the earth's surface shall in no case exceed −159 dBW/m per 4 kHz for all angles of arrival.

US308 In the frequency bands 1549.5—1558.5 MHz and 1651—1660 MHz, the Aeronautical-Mobile-Satellite (R) requirements that cannot be accommodated in the 1545–1549.5 MHz, 1558.5–1559 MHz, 1646.5–1651 MHz and 1660–1660.5 MHz bands shall have priority access with real-time preemptive capability for communications in the mobile satelite service. Systems not interoperable with the aeronautical mobile-satellite (R) service shall operate on a secondary basis. Account shall be taken of the priority of safety-related communications in the mobile-satellite service.

US309 Transmissions in the bands 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.

US310 In the band 14.896–15.121 GHz, non-Government space stations in the space research service may be authorized on a secondary basis to transmit to Tracking and Data Relay Satellites 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 −138 to −148 dBW/m²/kHz, depending on the angle of arrival, in accordance with CCIR Recommendation 510–1.

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 and 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

50 mile radius circles centered on:

Very long baseline array stations	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°57
North Liberty, IA	41°46	91°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 areas.

US312 The frequency 173.075 MHz may also be authorized on a primary basis to non-Government stations in the Police Radio Service (with a maximum authorized bandwidth of 20 kHz) for stolen vehicle recovery systems.

US315 In the frequency bands 1530–1544 MHz and 1626.5–1645.5 MHz maritime mobile-satellite distress and safety communications, e.g., GMDSS, shall have priority access with real-time preemptive capability in the mobile-satellite service. Communications of mobile-satellite system stations not participating in the GMDSS shall operate on a secondary basis to distress and safety communications of stations operating in the GMDSS. Account shall be taken of the priority of safety-related communications in the mobile-satellite service.

US316 The band 2900–3100 MHz is also allocated on a primary basis to the Meteorological Aids Service. Operations in this service are limited to Government Next Generation Weather Radar (NEXRAD) systems where accommodation in the 2700–2900 MHz band is not technically practical and are subject to coordination with existing authorized stations.''

US317 The band 218.0–219.0 MHz is allocated on a primary basis to the Interactive Video and Data operations.

US318 Until January 1, 2000, the use of the 137–138 MHz band by the mobile-satellite service will be secondary to Government satellite operations in the subbands: 137.333–137.367, 137.485–137.515, 137.605–137.635 and 137.753–137.787 MHz.

US319 In the 137–138, 148–149.9, 149.9–150.05, 399.9–400.05, and 400.15–401 MHz bands, Government stations in the mobile-satellite service shall be limited to earth stations operating with non-Government satellites.

US320 Use of the 137–138, 148–149.9, and 400.15–401 MHz bands by the mobile-satellite service is limited to non-voice, non-geostationary satellite systems and may include satellite links between land earth stations at fixed locations.

US321 The 535–1705 kHz band is also allocated to the mobile service on a secondary basis for the distribution of public service information from non-government Travelers Information Stations operating in the Local Government Radio Service on 10 kHz spaced channels from 540 to 1700 kHz.

US322 The 149.9–150.05 MHz band is allocated to the mobile-satellite service (Earth-to-space) on a primary basis after 1 January 1997 and shall be limited to non-voice, non-geostationary satellite systems, including satellite links between land earth stations. Before 1 January 1997 use of this band on a secondary basis for the mobile satellite service is allowed for land earth stations at fixed locations.

US323 In the 148–149.9 MHz band, no individual mobile earth station shall transmit, on the same frequency being actively used by fixed and mobile stations and shall transmit no more than 1% of the time during any 15 minute period; except, individual mobile earth stations in this band that do not avoid frequencies actively being used by the fixed and mobile services shall not exceed a power density of −16 dBW/4kHz and shall transmit no more than 0.25% of the time during any 15 minute period. Any single transmission from any individual mobile earth station operating in this band shall not exceed 450 ms in duration and consecutive transmissions from a single mobile earth station on the same frequency shall be separated by at least 15 seconds. Land earth stations in this band shall be subject to electromagnetic compatibility analysis and coordination with terrestrial fixed and mobile stations.

US324 Government and non-Government satellite systems in the 400.15–401 MHz band shall be subject to electromagnetic compatibility analysis and coordination.

US325 In the band 148–149.9 MHz fixed and mobile stations shall not claim protection from land earth stations in the mobile-satellite service that have been previously coordinated; Government fixed and mobile stations exceeding 27 dBW EIRP, or an emission bandwidth greater than 38 kHz, will be coordinated with existing mobile-satellite service space stations.

US326 The 399.9–400.05 MHz band is allocated to the mobile-satellite service (Earth-to-space) on a primary basis after January 1, 1997 and shall be limited to non-voice, non-

geostationary satellite systems, including satellite links between land earth stations.

US327 The band 2310–2360 MHz is allocated to the broadcasting-satellite service (sound) and complementary terrestrial broadcasting service on a primary basis. Such use is limited to digital audio broadcasting and is subject to the provisions of Resolution 528.

US328 In the band 2310–2360 MHz, the mobile and radiolocation services are allocated on a primary basis until 1 January 1997 or until a broadcasting-satellite (sound) service has been brought into use in such a manner as to affect or be affected by the mobile and radiolocation services in those service areas, whichever is later. The broadcasting-satellite (sound) service during implementation should also take cognizance of the expendable and reusable launch vehicle frequencies 2312.5, 2332.5, and 2352.5 MHz, to minimize the impact on this mobile service use to the extent possible.

US334 In the band 17.8–20.2 GHz, Government space stations and associated earth stations in the fixed satellite (space-to-Earth) service may be authorized on a primary basis. For a Government geostationary satellite network to operate on a primary basis, the space station shall be located outside the arc measured from East to West, 70°W to 120°W. Coordination between Government fixed-satellite systems and non-Government systems operating in accordance with the United States Table of Frequency Allocations is required.

NON-GOVERNMENT (NG) FOOTNOTES

(These footnotes, each consisting of the letters ''NG'' followed by one or more digits, denote stipulations applicable only to the non-Government.)

NG2 Facsimile broadcasting stations may be authorized in the band 88–108 MHz.

NG3 Control stations in the domestic public mobile radio service may be authorized frequencies in the band 72–73 and 75.4–76 MHz on the condition that harmful interference will not be caused to operational fixed stations.

NG4 The use of the frequencies in the band 152.84–153.38 MHz may be authorized, in any area, to remote pickup broadcast base and mobile stations on the condition that harmful interference will not be caused to stations operating in accordance with the Table of Frequency Allocations.

NG6 Stations in the public safety radio services authorized as of June 30, 1958, to use frequencies in the band 159.51–161.79 MHz in areas other than Puerto Rico and the Virgin Islands may continue such operation, including expansion of existing systems, on the condition that harmful interference will not be caused to stations in the services to which these bands are allocated. In Puerto Rico and the Virgin Islands this authority is limited to frequencies in the band 160.05–161.37 MHz. No new public radio service system will be authorized to operate on these frequencies.

NG12 Frequencies in the bands 454.40–455 MHz and 459.40–460 MHz may be assigned to domestic public land and mobile stations to provide a two-way air-ground public radiotelephone service.

NG17 Stations in the land transportation radio services authorized as of May 15, 1958 to operate on the frequency 161.61 MHz may, upon proper application, continue to be authorized for such operation, including expansion of existing systems, on the condition that harmful interference will not be caused to the operation of any authorized station in the maritime mobile service. No new land transportation radio service system will be authorized to operate on 161.61 MHz.

NG19 Fixed stations associated with the maritime mobile service may be authorized, for purposes of communication with coast stations, to use frequencies assignable to ship stations in this band on the condition that harmful interference will not be caused to services operating in accordance with the Table of Frequency Allocations.

NG23 Frequencies in the band 2100–2200 MHz may also be assigned to stations in the international fixed public radio service located south of 25°30 north latitutde in the State of Florida and in U.S. Possessions in the Caribbean area, provided, however, no new assignments in the band 2150–2162 MHz will be made to such stations after February 25, 1974.

NG28 The frequency band 160.86–161.40 MHz is available for assignment to remote pickup base and remote pickup mobile stations in Puerto Rico and the Virgin Islands only on a shared basis with the land transportation radio service.

NG30 Stations in the international fixed public radiocommunication service in Florida, south of 25°30 north latitude, may be authorized to use frequencies in the band 716–890 MHz on the condition that harmful interference will not be caused to the broadcasting service of any country. This is an interim allocation the termination of which will later be specified by the Commission when it is determined that equipments are generally available for use in bands allocated internationally to the fixed service.

NG31 Stations in the Rural Radio Service licensed for Basic Exchange Telecommunications Radio Service may be authorized to use some frequencies in the bands 816–820 MHz (fixed subscriber) and 861–865 MHz (central office or base), on a co-primary basis with private land mobile radio licensees, pursuant to part 22 subpart H.

NG41 Frequencies in the bands 3700–4200 MHz, 5925–6425 MHz, and 10.7–11.7 GHz may

also be assigned to stations in the international fixed public and international control services located in U.S. Possessions in the Caribbean area.

NG42 Non-Government stations in the radiolocation service shall not cause harmful interference to the amateur service.

NG43 Fixed stations in the domestic public radio services in Alaska, south of 56° north latitude and east of 134° west longitude, may be authorized to use frequencies in the band 800–830 MHz, on the condition that harmful interference will not be caused to the broadcasting service of any country.

NG47 In Alaska frequencies between the band 2655–2690 MHz are not available for assignment to terrestrial stations.

NG49 The following frequencies may be authorized for mobile operations in the Manufacturers Radio Service subject to the condition that no interference is caused to the reception of television stations operating on channels 4 and 5 and that their use is limited to a manufacturing facility:

MHz	
72.02	72.22
72.04	72.24
72.06	72.26
72.08	72.28
72.10	72.30
72.12	72.32
72.14	72.34
72.16	72.36
72.18	72.38
72.20	72.40

Further, the following frequencies may be authorized for mobile operations in the Special Industrial Radio Service, Manufacturers Radio Service, Railroad Radio Service and Forest Products Radio Service subject to the condition that no interference is caused to the reception of television stations operating on channels 4 and 5; and that their use is limited to a railroad yard, manufacturing plant, logging site, mill, or similar industrial facility.

MHz	
72.44	75.44
72.48	75.48
72.52	75.52
72.56	75.56
72.60	75.60

NG51 In Puerto Rico and the Virgin Islands only, the bands 150.8–150.98 MHz and 150.98–151.49 MHz are allocated exclusively to the business radio service.

NG53 In the band 12.7–13.15 GHz, television pickup stations and CARS pickup stations shall be assigned channels on a coequal basis and shall operate on a secondary basis to fixed stations operating in accordance with the Table of Frequency Allocations. In the 13.15–13.20 GHz band television pickup stations and CARS pickup stations shall be assigned on an exclusive basis in the top one hundred markets, as set out in Section 76.51.

NG56 In the bands 72.0–73.0 and 75.4–76.0 MHz, the use of mobile radio remote control of models is on a secondary basis to all other fixed and mobile operations. Such operations are subject to the condition that interference will not be caused to common carrier domestic public stations, to remote control of industrial equipment operating in the 72–76 MHz band, or to the reception of television signal on channels 4 (66–72 MHz) or 5 (76–82 MHz). Television interference shall be considered to occur whenever reception of regularly used television signals is impaired or destroyed, regardless of the strength of the television signal or the distance to the television station.

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.

NG63 Television Broadcast translator stations holding valid licenses on November 15, 1971, to operate in the frequency band 806–890 MHz (channels 70–83), may continue to operate in this band, pursuant to periodic license renewals, on a secondary basis to the land mobile radio service.

NG66 The frequency band 470–512 MHz is allocated for use in the broadcasting and land mobile radio services. In the land mobile services it is available for assignment in the domestic public, public safety, industrial, and land transportation radio services at, or in the vicinity of 13 urbanized areas of the United States, as set forth in the table below. Additionally, in the land mobile services, TV Channel 16 is available for assignment in the public safety radio services at, or in the vicinity of Los Angeles. Such use in the land mobile services is subject to the conditions set forth in parts 22 and 90 of this chapter, CFR 47.

Urbanized area	TV channel
New York-Northeastern New Jersey	14, 15
Los Angeles	14, 20
Chicago-Northwestern Indiana	14, 15
Philadelphia, PA-New Jersey	19, 20
Detroit, Michigan	15, 16
San Francisco-Oakland, California	16, 17
Boston, Mass	14, 16
Washington, D.C.-Maryland-Virginia	17, 18
Pittsburgh, PA	14, 18
Cleveland, Ohio	14, 15
Miami, Florida	14
Houston, Texas	17
Dallas, Texas	16

NG70 In Puerto Rico and the Virgin Islands only, the bands 159.240–159.435 and

160.410–160.620 MHz are also available for assignment to base stations and mobile stations in the special industrial radio service.

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 areas including American Samoa, the Trust Territory of the Pacific Islands, Guam and Hawaii;

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

NG104 The use of the bands 10.7–11.7 and 12.75–13.25 GHz in the fixed-satellite service is limited to international systems, i.e., other than domestic systems.

NG111 The band 157.4375–157.4625 MHz may be used for one way paging operations in the special emergency radio service.

NG112 The frequencies 25.04, 25.08, 150.980, 154.585, 158.445, 159.480, 454.000 and 459.000 MHz may be authorized to stations in the petroleum radio service for use primarily in oil spill containment and cleanup operations and secondarily in regular land mobile communication.

NG114 In the Gulf of Mexico offshore from the Louisiana-Texas coast, the frequency band 476–494 MHz (TV channels 15, 16 and 17) is allocated to the Domestic Public and Private Land Mobile Radio Services in accordance with the regulations set forth in parts 22 and 90 respectively.

NG115 In the 174 to 216 MHz band wireless microphones may be authorized to operate on a secondary, non-interfering basis, subject to terms and conditions set forth in part 74 of these Rules and Regulations.

NG117 The frequency 156.050 and 156.175 MHz may be assigned to stations in the maritime mobile service for commercial and port operations in the New Orleans Vessel Traffic Service (VTS) area and the frequency 156.250 MHz may be assigned to stations in the maritime mobile service for port operating in the New Orleans and Houston VTS areas.

NG118 Television translator relay stations may be authorized to use frequencies in this band on a secondary basis to stations operating in accordance with the Table of Frequency Allocations.

NG120 Frequencies in the 928–960 MHz band may be assigned for multiple address systems and mobile operations on a primary basis as specified in part 94 of this chapter.

NG124 In the public safety radio service allocations within the bands 30–50 MHz, 150–174 MHz and 450–470 MHz, police radio service licenses are authorized to operate low powered radio transmitters on a secondary, non-interference basis in accordance with the provisions of Sections 2.803 and 90.19(f)(5) of the Rules.

NG127 In Hawaii, the frequency band 488–494 MHz is allocated exclusively to the fixed service for use by common carrier control and repeater stations for point-to-point inter-island communications only.

NG128 In the 535–1705 kHz band, AM broadcast licensees or permittees may use their AM carrier on a secondary basis to transmit signals intended for both broadcast and non-broadcast purposes. In the 88–108 MHz band, FM broadcast licensees or permittees are permitted to use subcarriers on a secondary basis to transmit signals intended for both broadcast and non-broadcast purposes. In the 54–72, 76–88, 174–216 and 740–890 MHz bands, TV broadcast licensees or permittees are permitted to use subcarriers on a secondary basis for both broadcast and non-broadcast purposes.

NG129 In Alaska, the bands 76–88 MHz and 88–100 MHz are also allocated to the Fixed service on a secondary basis. Broadcast stations operating in these bands shall not cause interference to non-Government fixed operations authorized prior to January 1, 1982.

NG133 Stations authorized in the band 73–74.6 MHz as of December 1, 1961 may continue to operate until December 31, 1985. Such stations shall not be required to afford protection to radio astronomy observations within the United States and possessions, however, such stations must afford protection to the observatories of other countries.

NG134 In the band 10.45–10.5 GHz non-Government stations in the radiolocation service shall not cause harmful interference to the amateur and amateur-satellite services.

NG135 In the 420–430 MHz band the amateur service is not allocated north of line A (def. § 2.1).

NG139 Pending adopting of further specific rules concerning usage of the band 12.2–12.7 GHz by the fixed and broadcasting-satellite services, systems in these services may be authorized subject to the condition that adjustments in certain systems design or technical parameters may become necessary during the systems lifetime. The necessity for such adjustments, and their extent, will be dependent upon the Final Acts of the 1983 Regional Administrative Radio Conference and subsequent Commission decisions.

NG140 Pending adopting of further specific rules concerning usage of the band 17.3–17.8 GHz by the fixed-satellite service for the purpose of providing feeder links to the broadcasting-satellite service, systems may be authorized for this purpose subject to the condition that adjustments in certain systems design or technical parameters may become necessary during the system lifetime. The necessity for such adjustments, and their extent, will be dependent upon the Final Acts of the 1983 Regional Administrative Radio Conference and subsequent Commission decisions.

NG141 The frequencies 42.40 MHz and 44.10 MHz are authorized on a primary basis in the State of Alaska for meteor burst communications by fixed stations in the Rural Radio Service operating under the provisions of part 22 of this chapter. The frequencies 44.20 MHz and 45.90 MHz are authorized on a primary basis in Alaska for meteor burst communications by fixed private radio stations operating under the provisions of part 90 of the chapter. The private radio station frequencies may be used by Common Carrier stations on a secondary, noninterference basis and the Common Carrier frequencies may be used by private radio stations for meteor burst communications on a secondary, noninterference basis. Users shall cooperate to the extent practical to minimize potential interference. Stations utilizing meteor burst communications shall not cause harmful interference to stations of other radio services operating in accordance with the Table of Frequency Allocations.

NG142 TV broadcast stations authorized to operate in the bands 54–72, 76–88, 174–216, 470–512, and 512–806 MHz may use a portion of the television vertical blanking interval for the transmission of telecommunications signals, on the condition that harmful intereference will not be caused to the reception of primary services, and that such telecommunications services must accept any interference caused by primary services operating in these bands.

NG143 In the band 11.7–12.2 GHz protection from harmful interference shall be afforded to transmissions from space stations not in conformance with international footnote 839 only if the operations of such space stations impose no unacceptable constraints on operations or orbit locations of space stations in conformance with 839.

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.

NG145 In the band 11.7–12.2 GHz, transponders on space stations in the fixed-satellite service may be used additionally for transmissions in the broadcasting-satellite service, provided that such transmissions do not have a maximum e.i.r.p. greater than 53 dBW per television channel and do not cause greater interference or require more protection from interference than the coordinated fixed-satellite service frequency assignments. With respect to the space services, this band shall be used principally for the fixed-satellite service.

NG147 Stations in the broadcast auxiliary service and private radio services licensed as of July 25, 1985, or on a subsequent date following as a result of submitting an application for license on or before July 25, 1985, may continue to operate on a primary basis with the radiodetermination satellite service.

NG148 The frequencies 154.585 MHz, 159.480 MHz, 160.725 MHz, 160.785 MHz, 454.000 MHz and 459.000 MHz may be authorized to maritime mobile stations for offshore radiolocation and associated telecommand operations.

NG149 The frequency bands 54–72 MHz, 76–88 MHz, 174–216 MHz, 470–512 MHz, 512–608 MHz, and 614–806 MHZ are also allocated to the Fixed Service to permit subscription television operations in accordance with Part 73 of the rules.

NG151 In the frequency bands 824–849 MHz and 869–894 MHz, cellular land mobile licensees are permitted to offer auxiliary services on a secondary basis subject to the provisions of part 22.

NG152 The band 219–220 MHz is also allocated to the amateur service on a secondary basis for stations participating, as forwarding stations, in point-to-point fixed digital message forwarding systems, including intercity packet backbone networks.

NG153 The 2110–2150 MHz and 2160–2200 MHz bands are reserved for future emerging technologies on a co-primary basis with the fixed and mobile services. Allocations to specific services will be made in future proceedings.

NG154 The 157.1875–157.45 MHz and 161.775–162.0125 MHz bands are also allocated to the land mobile service for assignment to stations as described in part 90 of this chapter.

GOVERNMENT (G) FOOTNOTES

(These footnotes, each consisting of the letter ''G'' followed by one or more digits, denote stipulations applicable only to the Government.)

G2 In the bands 216–225, 420–450 (except as provided by US 217), 890–902, 928–942, 1300–1400, 2300–2390, 2400–2402, 2417–2450, 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.

G8 Low power Government radio control operations are permitted in the band 420–450 MHz.

G11 Government fixed and mobile radio services, including low power radio control operations, are permitted in the band 902–928 MHz on a secondary basis.

G15 Use of the band 2700–2900 MHz by the military fixed and shipborne air defense radiolocation installations will be fully coordinated with the meteorological aids and aeronautical radionavigation services. The military air defense installations will be moved from the band 2700–2900 MHz at the earliest practicable date. Until such time as military air defense installations can be accommodated satisfactorily elsewhere in the spectrum, such operations will, insofar as practicable, be adjusted to meet the requirements of the aeronautical radionavigation service.

G19 Use of the band 9000–9200 MHz by military fixed and shipborne air defense radiolocation installations will be fully coordinated with the aeronautical radionavigation service, recognizing fully the safety aspects of the latter. Military air defense installations will be accommodated ultimately outside this band. Until such time as military defense installations can be accommodated satisfactorily elsewhere in the spectrum such operations will, insofar as practicable, be adjusted to meet the requirements of the aeronautical radionavigation services.

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 3300–3500 MHz, the Government radiolocation is limited to the military services, except as provided by footnote.

G32 Except for weather radars on meteorological satellites in the band 9975–10025 MHz and for Government survey operations (see footnote US108), Government radiolocation in the band 10000–10500 MHz is limited to the military services.

G34 In the band 34.4–34.5 GHz, weather radars on board meteorological satellites for cloud detection are authorized to operate on the basis of equality with military radiolocation devices. All other non-military radiolocation in the band 33.4–36.0 GHz shall be secondary to the military services.

G42 Space command, control, range and range rate systems for earth station transmission only (including installations on certain Navy ships) may be accommodated on a co-equal basis with the fixed and mobile services in the band 1761–1842 MHz. Specific frequencies required to be used at any location will be satisfied on a coordinated case-by-case basis.

G56 Government radiolocation in the bands 1215–1300, 2900–3100, 5350–5650 and 9300–9500 MHz is primarily for the military services; however, limited secondary use is permitted by other Government agencies in support of experimentation and research programs. In addition, limited secondary use is permitted for survey operations in the band 2900–3100 MHz.

G59 In the bands 902–928 MHz, 3100–3300 MHz, 3500–3700 MHz, 5250–5350 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 subband 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 services.

G104 In the bands 7450–7550 and 8175–8215 MHz, it is agreed that although the military space radio communication systems, which include earth stations near the proposed meteorological-satellite installations will precede the meteorological-satellite installations, engineering adjustments to either the military or the meteorological-satellite systems or both will be made as mutually required to assure compatible operations of the systems concerned.

G106 The bands 2501–2502, 5003–5055 kHz, 10003–10005 kHz, 15005–15010 kHz, 19990–19995 kHz, 20005–20010 kHz and 25005–25010 kHz are also allocated on a secondary basis to the space research service. The space research

transmissions are subject to immediate temporary or permanent shutdown in the event of interference to the reception of the standard frequency and time broadcasts.

G109 All assignments in the band 157.0375–157.1875 MHz are subject to adjustment to other frequencies in this band as long term U.S. maritime VHF planning develops, particularly that planning incident to support of the National VHF–FM Radiotelephone Safety and Distress System (See Doc. 15624/1–1.9.111/1.9.125).

G110 Government ground-based stations in the aeronautical radionavigation service may be authorized between 3500–3700 MHz where accommodation in the 2700–2900 MHz band is not technically and/or economically feasible.

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 conterminous United States. Within the conterminous 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.

G116 The band 7125–7155 MHz is also allocated for earth-to-space transmissions in the Space Operations Service at a limited number of sites (not to exceed two), subject to established coordination procedures.

G117 In the bands 7.25–7.75 GHz, 7.9–8.4 GHz, 17.8–21.2 GHz, 30–31 GHz, 39.5–40.5 GHz, 43.5–45.5 GHz and 50.4–51.4 GHz the Government fixed-satellite and mobile-satellite services are limited to military systems.

G118 Government fixed stations may be authorized in the band 1700–1710 MHz only if spectrum is not available in the band 1710–1850 MHz.

G119 In the band 14714.5–15136.5 MHz, assignments in the Fixed Service which were in existence as of January 1, 1982 may continue on a primary basis until January 1, 1990.

G122 The bands 2390–2400, 2402–2417 and 4660–4685 MHz were identified for immediate reallocation, effective August 10, 1994, for exclusive non-Government use under Title VI of the Omnibus Budget Reconciliation Act of 1993. Effective August 10, 1994, any Government operations in these bands are on a non-interference basis to authorized non-Government operations and shall not hinder the implementation of any non-Government operations.

[49 FR 2373, Jan. 19, 1984]

EDITORIAL NOTE 1: For FEDERAL REGISTER citations affecting §2.106, see the List of CFR Sections Affected in the Finding Aids section of this volume.

EDITORIAL NOTE 2: At 58 FR 27949, May 12, 1993, the following footnote US321 to the table in §2.106 was published. Footnote US321 was not codified due to ambiguities in the amendatory instructions. For the convenience of the reader footnote US321 as published at 58 FR 27949, May 12, 1993, is set forth below.

§2.106 Table of Frequency Allocations.

UNITED STATES (US) FOOTNOTES

* * * * *

US321—The 535–1705 kHz band is also allocated to the mobile service on a secondary basis for the distribution of public service information from non-government Travelers Information stations operation in the Local Government Radio Service on 10 kHz spaced channels from 540 to 1700 kHz.

* * * * *

EDITORIAL NOTE 3: At 59 FR 9417, Feb. 28, 1994, the following footnote NG147 to the table in §2.106 was published. Footnote NG147 was not codified due to ambiguities in the amendatory instructions. For the convenience of the reader footnote NG147 as published at 59 FR 9417, Feb. 28, 1994, is set forth below.

§2.106 Table of Frequency Allocations.

NON-GOVERNMENT (NG) FOOTNOTES

* * * * *

NG147—Stations in the broadcast auxiliary service and private radio services licensed as of July 25, 1985, or on a subsequent date following as a result of submitting an application for license on or before July 25, 1985, may continue to operate on a radiodetermination satellite service.

* * * * *

EFFECTIVE DATE NOTE: At 61 FR 45342, Aug. 29, 1996, the table in §2.106 was amended by revising the entries for 26175–28000 kHz, 29.7–37.5 MHz, 38.25–47 MHz, 150.05–174 MHz, 220–222 MHz, 450–960 MHz, and 1710–2110 MHz in columns (1) through (7), effective Oct. 28, 1996. Additionally International footnotes 672, 675, 676, 678, 697, and 703 were revised, and International footnotes 551, 612 614, 682, and 708 and United States footnotes US330 and US 331 were removed, effective Oct. 28, 1996. For

the convenience of the user, the superseded text is set forth as follows:

§ 2.106 Table of Frequency Allocations.

* * * * *

International table			United States table		FCC use designators	
Region 1—allocation kHz	Region 2—allocation kHz	Region 3—allocation kHz	Government	Non-Government	Rule part(s)	Special-use frequencies
			Allocation kHz	Allocation kHz		
(1)	(2)	(3)	(4)	(5)	(6)	(7)
*	*	*	*	*	*	*
26175–27500	FIXED MOBILE except aeronautical Mobile 546		26175–26480	26175–26480 LAND MOBILE	AUXILIARY BROADCASTING (74)	
			26480–26950 FIXED MOBILE except aeronautical mobile US10	26480–26950 US10		
			26950–27540	26950–26960 FIXED 546	INTERNATIONAL FIXED PUBLIC (23)	
				26960–27230 MOBILE except aeronautical mobile 546	PERSONAL (95)	27120±160 kHz: Industrial, scientific, and medical frequency
				27230–27410 FIXED MOBILE except aeronautical mobile 546	PERSONAL (95) PRIVATE LAND MOBILE (90)	
				27410–27540 LAND MOBILE	PRIVATE LAND MOBILE (90)	

International table			United States table		FCC use designators	
Region 1—allocation kHz	Region 2—allocation kHz	Region 3—allocation kHz	Government	Non-Government	Rule part(s)	Special-use frequencies
			Allocation kHz	Allocation kHz		
(1)	(2)	(3)	(4)	(5)	(6)	(7)
27500–28000	METEOROLOGICAL AIDS FIXED MOBILE		546			
			27540–28000 FIXED MOBILE	27540–28000		
*	*	*	*	*	*	*

International table			United States table		FCC use designators	
Region 1—allocation MHz	Region 2—allocation MHz	Region 3—allocation MHz	Government	Non-Government	Rule part(s)	Special-use frequencies
			Allocation MHz	Allocation MHz		
(1)	(2)	(3)	(4)	(5)	(6)	(7)
*	*	*	*	*	*	*
29.7–30.005	FIXED MOBILE		29.7–29.89	29.7–29.8 LAND MOBILE	PRIVATE LAND MOBILE (90)	
				29.8–29.89 FIXED	AVIATION (87) INTERNATIONAL FIXED PUBLIC (23)	
			29.89–29.91 FIXED MOBILE	29.89–29.91		
			29.91–30.0	29.91–30.0 FIXED	AVIATION (87) INTERNATIONAL FIXED PUBLIC (23)	

			30.0–30.56 MOBILE Fixed	30.0–30.56		
30.005–30.01	FIXED MOBILE SPACE RESEARCH SPACE OPERATIONS (satellite identification)					
30.01–37.5	FIXED MOBILE		30.56–32.0	30.56–32.0 LAND MOBILE NG124	PRIVATE LAND MOBILE (90)	
			32.0–33.0 FIXED MOBILE	32.0–33.0		
			33.0–34.0	33.0–34.0 LAND MOBILE NG124	PRIVATE LAND MOBILE (90)	
			34.0–35.0 FIXED MOBILE	34.0–35.0		
			35.0–36.0	35.0–35.19 LAND MOBILE NG124	PRIVATE LAND MOBILE (90)	
				35.19–35.69 LAND MOBILE NG124	DOMESTIC PUBLIC LAND MOBILE (22) PRIVATE LAND MOBILE (90)	
				35.69–36.0 LAND MOBILE NG124	PRIVATE LAND MOBILE (90)	

International table			United States table		FCC use designators	
Region 1—allocation MHz	Region 2—allocation MHz	Region 3—allocation MHz	Government Allocation MHz	Non-Government Allocation MHz	Rule part(s)	Special-use frequencies
(1)	(2)	(3)	(4)	(5)	(6)	(7)
			36.0–37.0 FIXED MOBILE US220	36.0–37.0 US220		
			37.0–37.5	37.0–37.5 LAND MOBILE NG124	PRIVATE LAND MOBILE (90)	
*	*	*	*	*	*	*
38.25–39.986	FIXED MOBILE		38.25–39.0 FIXED MOBILE	38.25–39.0		
			39.0–40.0	39.0–40.0 LAND MOBILE NG124	PRIVATE LAND MOBILE (90)	
39.986–40.02	FIXED MOBILE Space Research					
			40.0–42.0 FIXED MOBILE	40.0–42.0		40.68 MHz±.02 MHz: Industrial, scientific and medical frequency
40.02–40.98	FIXED MOBILE 548					
40.98–41.015						

	FIXED MOBILE Space Research 549 550 551					
41.015–44.0	FIXED MOBILE 549 550 551	LAND MOBILE	548 US210 US220	548 US210 US220		
			42.0–46.6 PRIVATE LAND MOBILE (90)	42.0–43.19 NG124 NG141		
				43.19–43.69 LAND MOBILE NG124	DOMESTIC PUBLIC LAND MOBILE (22) PRIVATE LAND MOBILE (90)	
44.0–47.0	FIXED MOBILE 551 552			43.69–46.6 LAND MOBILE NG124 NG141	PRIVATE LAND MOBILE (90)	
			46.6–47.0 FIXED MOBILE	46.6–45.0		
*	*	*	*	*	*	*
150.05–153 FIXED MOBILE except aeronautical mobile RADIO ASTRONOMY	150.05–156.7625 FIXED MOBILE		150.05–150.8 FIXED MOBILE US216 G30	150.05–150.8 US216		
			150.8–156.2475	150.8–152 LAND MOBILE NG51 NG112 NG124	PRIVATE LAND MOBILE (90)	
				152.0–152.255 LAND MOBILE	DOMESTIC PUBLIC LAND MOBILE (22)	

International table			United States table		FCC use designators	
Region 1—allocation MHz	Region 2—allocation MHz	Region 3—allocation MHz	Government	Non-Government	Rule part(s)	Special-use frequencies
			Allocation MHz	Allocation MHz		
(1)	(2)	(3)	(4)	(5)	(6)	(7)
610 612				US216		
				152.255–152.495 LAND MOBILE NG124	PRIVATE LAND MOBILE (90)	
				152.495–152.855 LAND MOBILE NG4	DOMESTIC PUBLIC LAND MOBILE (22)	
153–154 FIXED MOBILE except aeronautical mobile (R) Meteorological Aids				152.855–156.2475 LAND MOBILE	PRIVATE LAND MOBILE (90) AUXILIARY BROADCASTING (74) MARITIME (80)	
154.0–156.7625 FIXED MOBILE except aeronautical mobile (R)			613 US216	613 613A NG4 NG112 NG117 NG124 NG148		
613 613A	611 613 613A		156.2475–157.0375	156.2475–157.0375 MARITIME MOBILE		
156.7625–156.8375	MARITIME MOBILE (distress and calling) 501 613					

156.8375–174 FIXED MOBILE except aeronautical mobile	156.8375–174 FIXED MOBILE		613 613A US77 US106 US107 US266	613 613A US77 US106 US107 US266 NG117		
			157.0375–157.1875 MARITIME MOBILE 613 US214 US266 G109	157.0375–157.1875 613 US214 US266	Private Land Mobile (90)	
			157.1875–157.45 613 US223 US266	157.1875–157.45 MARITIME MOBILE LAND MOBILE 613 US223 US266 NG111 NG154	MARITIME (80) PRIVATE LAND MOBILE (90)	
			157.45–161.575	157.45–157.755 LAND MOBILE 613 US266 NG111 NG124	PRIVATE LAND MOBILE (90)	
				157.755–158.115 LAND MOBILE 613	DOMESTIC PUBLIC LAND MOBILE (22)	
			613 US266	158.115–161.575 LAND MOBILE NG6 613 NG6 NG28 NG70 NG112 NG124 NG148	DOMESTIC PUBLIC LAND MOBILE (22) PRIVATE LAND MOBILE (90) MARITIME (80)	
			161.575–161.625 613 US77	161.575–161.625 MARITIME MOBILE 613 US77 NG6 NG17	DOMESTIC PUBLIC LAND MOBILE (22) MARITIME (80)	
			161.625–161.775	161.625–161.775 LAND MOBILE	AUXILIARY BROADCASTING (74) DOMESTIC PUBLIC LAND MOBILE (22)	

International table			United States table		FCC use designators	
Region 1—allocation MHz	Region 2—allocation MHz	Region 3—allocation MHz	Government Allocation MHz	Non-Government Allocation MHz	Rule part(s)	Special-use frequencies
(1)	(2)	(3)	(4)	(5)	(6)	(7)
			613	613 NG6		
			161.775–162.0125	161.775–162.0125 MARITIME MOBILE LAND MOBILE 613 US266 NG6 NG154	DOMESTIC PUBLIC LAND MOBILE (22) MARITIME (80) PRIVATE LAND MOBILE (90)	
			162.0125–173.2 FIXED MOBILE 613 US8 US11 US13 US216 US223 US300 US312 G5	162.0125–173.2 613 US8 US11 US13 US216 US223 US300 US312	Auxiliary Broadcasting (74) Private Land Mobile (90)	
			173.2–173.4	173.2–173.4 FIXED Land Mobile NG124	Private Land Mobile (90)	
613 613B 614 615	613 616 617 618		173.4–174.0 FIXED MOBILE G5	173.4–174.0		
*	*	*	*	*	*	*
220–222 BROADCASTING 621 623 628 629	220–222 AMATEUR FIXED MOBILE Radiolocation 627	220–222 FIXED MOBILE BROADCASTING 619 624 625 626 630	220–222 LAND MOBILE Radiolocation 627 G2	220–222 LAND MOBILE 627	PRIVATE LAND MOBILE (90)	
*	*	*	*	*	*	*
450–460			450–460	450–451		

	FIXED MOBILE 653 668 669 670		668 669 670 US87	LAND MOBILE 668 US87	AUXILIARY BROAD-CASTING (74) SATELLITE COMMU-NICATION (25)	
				451–454 LAND MOBILE NG112 NG124	PRIVATE LAND MOBILE (90)	
				454–455 LAND MOBILE NG12 NG112 NG148	DOMESTIC PUBLIC LAND MOBILE (22) MARITIME (80)	
				455–456 LAND MOBILE	AUXILIARY BROAD-CASTING (74)	
				456–459 LAND MOBILE 669 670 NG112 NG124	PRIVATE LAND MOBILE (90)	
				459–460 LAND MOBILE NG12 NG112 NG148	DOMESTIC PUBLIC LAND MOBILE (22) MARITIME (80)	
460–470	FIXED MOBILE Meterological-Statellite (space-to-Earth)		460–470 Meterological-Satellite (space-to-Earth)	460–462.5375 LAND MOBILE 671 US201 US209 NG124	PRIVATE LAND MOBILE (90)	
				462.5375–462.7375 LAND MOBILE 671 US201	PERSONAL (95)	
				462.7375–467.5375 LAND MOBILE	PRIVATE LAND MOBILE (90)	

International table			United States table		FCC use designators	
Region 1—allocation MHz	Region 2—allocation MHz	Region 3—allocation MHz	Government Allocation MHz	Non-Government Allocation MHz	Rule part(s)	Special-use frequencies
(1)	(2)	(3)	(4)	(5)	(6)	(7)
				669 671 US201 US209 US216 NG124		
				467.5375–467.7375 LAND MOBILE 669 671 US201	PERSONAL (95)	
				467.7375–470.0 LAND MOBILE	PRIVATE LAND MOBILE (90)	
	669 670 671 672		669 670 671 US201 US209 US216	669 670 671 US201 US216 NG124		
470–790 BROADCASTING	470–512 BROADCASTING Fixed Mobile	470–585 FIXED MOBILE BROADCASTING	470–512	470–512 BROADCASTING LAND MOBILE	RADIO BROADCAST (TV) (73) DOMESTIC PUBLIC LAND MOBILE (22) PRIVATE LAND MOBILE (90)	
	674 675			NG66 NG114 NG127 NG128 NG149	Auxiliary Broadcasting (74)	
	512–608 BROADCASTING		512–608	512–608 BROADCASTING	RADIO BROADCAST (TV) (73) Auxiliary Broadcasting (74)	
		673 677 679				
		585–610 FIXED MOBILE BROADCASTING RADIONAVIGATION				
	678			NG128 NG149		

	608–614 RADIO ASTRONOMY Mobile-Satellite except aeronautical mobile-satellite (Earth-to-space)	688 689 690	608–614 RADIO ASTRONOMY US74 US246	608–614 RADIO ASTRONOMY US74 US246		
		610–890 FIXED MOBILE BROADCASTING				
667A 676 682 683 684 685 686 686A 687 689 693 694	614–806 BROADCASTING Fixed Mobile 675 692 692A 693		614–806	614–806 BROADCASTING NG30 NG43 NG128 NG149	RADIO BROADCAST (TV) (73) Auxiliary Broadcasting (74)	
790–862 FIXED BROADCASTING	806–890 FIXED MOBILE BROADCASTING		806–902	806–821 LAND MOBILE NG30 NG43 NG63 NG31	PRIVATE LAND MOBILE (90)	
				821–824 LAND MOBILE NG30 NG43 NG63	PRIVATE LAND MOBILE (90)	
				824–849 LAND MOBILE NG30 NG43 NG63 NG151	DOMESTIC PUBLIC LAND MOBILE (22)	
				849–851 AERONAUTICAL MOBILE NG30 NG63 NG153	PUBLIC MOBILE (22)	
				851–866		

International table			United States table		FCC use designators	
			Government	Non-Government		
Region 1—allocation MHz	Region 2—allocation MHz	Region 3—allocation MHz	Allocation MHz	Allocation MHz	Rule part(s)	Special-use frequencies
(1)	(2)	(3)	(4)	(5)	(6)	(7)
694 695 695A 1696 697 700B 702				LAND MOBILE NG30 NG63 NG31	PRIVATE LAND MOBILE (90)	
862–890 FIXED MOBILE except aeronautical mobile BROADCASTING 700B 703				866–869 LAND MOBILE NG30 NG63	PRIVATE LAND MOBILE (90)	
704	692A 700 700A	677 688 689 690 691 693		869–894 LAND MOBILE NG30 NG63 US116 US268 NG151	DOMESTIC PUBLIC LAND MOBILE (22)	
890–942 FIXED MOBILE except aeronautical mobile BROADCASTING 703 Radiolocation	890–902 FIXED MOBILE except aeronautical mobile Radiolocation	890–942 FIXED MOBILE BROADCASTING Radiolocation		894–896 AERONAUTICAL MOBILE US116 US268 NG153	PUBLIC MOBILE (22)	
				896–901 LAND MOBILE US116 US268	PRIVATE LAND MOBILE (90)	

700A 704A 705	901–902 FIXED MOBILE US116 US268 US330	PERSONAL COMMUNICATIONS SERVICES (99)	
902–928 FIXED Amateur Mobile except aeronautical mobile Radiolocation 705 707 707A	902–928 RADIOLOCATION 707 US215 US218 US267 US275 G11 G59	902–928 707 US215 US218 US267 US275	Private Land Mobile (90) Amateur (97)	915±13 MHz: Industrial, scientific and medical frequency
928–942 FIXED MOBILE except aeronautical mobile Radiolocation	928–932	928–929 FIXED US116 US215 US268	DOMESTIC PUBLIC LAND MOBILE (22) PRIVATE LAND MOBILE (90) PRIVATE OPERATIONAL-FIXED MICROWAVE (94)	
		929–930 LAND MOBILE US116 US215 US268	POMESTIC PUBLIC LAND MOBILE (22) PRIVATE LAND MOBILE (90)	
		930–931 FIXED MOBILE US116 US215 US268 US330	PERSONAL COMMUNICATIONS SERVICES (99)	
		931–932 LAND MOBILE US116 US215 US268	DOMESTIC PUBLIC LAND MOBILE (22) PRIVATE LAND MOBILE (90)	
	932–935 FIXED US215 US268 G2	932–935 FIXED US215 US268		
	935–941	935–940		

International table			United States table		FCC use designators	
Region 1—allocation MHz	Region 2—allocation MHz	Region 3—allocation MHz	Government Allocation MHz	Non-Government Allocation MHz	Rule part(s)	Special-use frequencies
(1)	(2)	(3)	(4)	(5)	(6)	(7)
704		706	USII6 US215 US268 G2	LAND MOBILE US116 US215 US268	PRIVATE LAND MOBILE (90)	
				940–941 FIXED MOBILE US116 US268 US330	PERSONAL COMMUNICATIONS SERVICES (99)	
942–960 FIXED MOBILE except aeronautical mobile BROADCASTING 703	942–960 FIXED MOBILE	942–960 FIXED MOBILE BROADCASTING	941–944 FIXED US268 US301 US302	941–944 FIXED US268 US301 US302		
704	708	701	944–960	944–960 FIXED NG120	AUXILIARY BROADCASTING (74) DOMESTIC PUBLIC FIXED (22) INTERNATIONAL FIXED PUBLIC (23) PRIVATE OPERATIONAL-FIXED MICROWAVE (94)	
1710–1930	FIXED MOBILE 740A		1710–1850 FIXED MOBILE 722 US256 G42	1710–1850 722 US256		

	722 744 745 746 746A		1850–1990 US331	1850–1990 FIXED MOBILE US331	Personal communications services (24) Private operational-fixed microwave (94) Radio frequency devices (15)	
1930–1970 FIXED MOBILE 746A	1930–1970 FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) 746A	1930–1970 FIXED MOBILE 746A				
1970–1980 FIXED MOBILE 746A	1970–1980 FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) 746A 746B 746C	1970–1980 FIXED MOBILE 746A				
1980–2010	FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) 746A 746B 746C		1990–2110	1990–2110 FIXED MOBILE	AUXILIARY BROADCAST (74) CABLE TELEVISION (78)	
2010–2025	FIXED MOBILE 746A					
2025–2110	FIXED MOBILE 747A SPACE RESEARCH (Earth-to-space) (space-to-space) SPACE OPERATION (Earth-to-space) (space-to-space) EARTH EXPLORATION-SATELLITE (Earth-to-space) (space-to-space)					

International table			United States table		FCC use designators	
Region 1—allocation MHz	Region 2—allocation MHz	Region 3—allocation MHz	Government	Non-Government	Rule part(s)	Special-use frequencies
			Allocation MHz	Allocation MHz		
(1)	(2)	(3)	(4)	(5)	(6)	(7)
	750A		US90 US111 US219 US222	US90 US111 US219 US222 NG23 NG118		
*	*	*	*	*	*	*

* * * * *

551 *Additional allocation:* In France and Monaco, the band 41—47 MHz is also allocated to the broadcasting service on a primary basis until 1 January 1986 and, in the United Kingdom, until 1 January 1987.

* * * * *

612 *Additional allocation:* In Sweden and Switzerland the band 150.05—153 MHz is also allocated to the aeronautical mobile (OR) service on a secondary basis.

* * * * *

614 *Alternative allocation:* In France and Monaco, the band 162—174 MHz is allocated to the broadcasting service on a primary basis until 1 January 1985.

* * * * *

672 *Different category of service:* In Afghanistan, Bulgaria, China, Cuba, Hungary, Japan, Mongolia, Poland, Czechoslovakia and the U.S.S.R, the allocation of the band 460—470 MHz to the meteorological-satellite service (space-to-Earth) is on a primary basis (see No. 425) and is subject to agreement obtained under the procedure set forth in Article 14.

* * * * *

675 *Different category of service:* In Chile, Colombia, Ecuador, the United States, Guyana and Jamaica, the allocation of the bands 470—512 MHz and 614—806 MHz to the fixed and mobile services is on a primary basis (see No. 425), subject to agreement obtained under the procedure set forth in Article 14.

* * * * *

678 *Additional allocation:* In Costa Rica, El Salvador, Ecuador, the United States, Guatemala, Guyana, Honduras, Jamaica and Venezuela, the band 512—608 MHz is also allocated to the fixed and mobile services on a primary basis, subject to agreement obtained under the procedure set forth in Article 14.

* * * * *

682 *Additional allocation:* In France and Italy, the band 582—606 MHz is also allocated to the radionavigation service on a permitted basis until 1 January 1990.

* * * * *

697 *Additional allocation:* In the Federal Republic of Germany, Denmark, Egypt, Finland, Israel, Kenya, Libya, Liechtenstein, Monaco, Norway, the Netherlands, Sweden, Switzerland and Yugoslavia, the band 790–830 MHz, and in these same countries and in Spain, France, Malta and Syria, the band 830–862 MHz, are also allocated to the mobile, except aeronautical mobile, service in the countries mentioned in connection with each band referred to in this footnote shall not cause harmful interference, or claim protection from, stations or services operating in accordance with the Table in countries other than those mentioned in connection with the band.

* * * * *

703 In Region 1, in the band 862—960 MHz, stations of the broadcasting service shall be operated only in the African Broadcasting Area (see Nos. 400 to 403) excluding Algeria, Egypt, Libya and Morocco. Such operations shall be in accordance with the Final Acts of the African VHF/UHF Broadcasting Conference, Geneva, 1963.

* * * * *

708 *Different category of service:* In the United States, the allocation of the bands 942—947 MHz and 952—960 MHz to the mobile service is on a primary basis (see No. 425) and subject to agreement obtained under the procedure set forth in Article 14.

* * * * *

US330 In the frequency bands 901–902 MHz, 930–931 MHz, and 940–941 MHz, the only fixed services permitted are ancillary services used in support of mobile personal communications services.

US331 In the frequency band 1850–1990 MHz, the only fixed PCS services permitted are ancillary services used in support of mobile personal communications services.

* * * * *

§2.107 Radio astronomy station notification.

(a) Pursuant to No. 1492 of Article 13 and Section F of Appendix 3 to the international *Radio Regulations* (Geneva, 1982), operators of radio astronomy stations desiring international recognition of their use of specific radio astronomy frequencies or bands of frequencies for reception, should file the following information with the Commission for inclusion in the Master International Frequency Register:

(1) The center of the frequency band observed, in kilohertz up to 28,000 kHz inclusive, in megahertz above 28,000

kHz to 10,500 MHz inclusive and in gigahertz above 10,500 MHz.

(2) The date (actual or foreseen, as appropriate) when reception of the frequency band begins.

(3) The name and location of the station, including geographical coordinates in degrees and minutes.

(4) The width of the frequency band (in kHz) observed by the station.

(5) The antenna type and dimensions, effective area and angular coverage in azimuth and elevation.

(6) The regular hours of reception (in UTC) of the observed frequency.

(7) The overall receiving system noise temperature (in kelvins) referred to the output of the receiving antenna.

(8) The class of observations to be taken. Class A observations are those in which the sensitivity of the equipment is not a primary factor. Class B observations are those of such a nature that they can be made only with advanced low-noise receivers using the best techniques.

(9) The name and mailing address of the operator.

(b) The permanent discontinuance of observations, or any change to the information above, should also be filed with the Commission.

(c) Observations being conducted on frequencies or frequency bands not allocated to the radio astronomy service should be reported as in paragraph (a) of this section for information purposes. Information in this category will not be submitted for entry in the Master International Frequency Register and protection from interference will not be afforded such operations by stations in other services.

§ 2.108 Policy regarding the use of the fixed-satellite allocations in the 3.6–3.7, 4.5–4.8, and 5.85–5.925 GHz bands.

The use of the fixed-satellite allocations in the United States in the above bands will be governed by footnote US245. Use of the fixed-satellite service allocations in these bands is for the international fixed-satellite service, that is, for international inter-continental communications. Case-by-case electromagnetic compatibility analysis is required with all users of the bands. It is anticipated that one earth station on each coast can be successfully coordinated. Specific locations of these earth stations depend upon service requirements and case-by-case EMC analyses that demonstrate compatible operations.

Subpart C—Emissions

§ 2.201 Emission, modulation, and transmission characteristics.

The following system of designating emission, modulation, and transmission characteristics shall be employed.

(a) Emissions are designated according to their classification and their necessary bandwidth.

(b) A minimum of three symbols are used to describe the basic characteristics of radio waves. Emissions are classified and symbolized according to the following characteristics:

(1) First symbol—type of modulation of the main character;

(2) Second symbol—nature of signal(s) modulating the main carrier;

(3) Third symbol—type of information to be transmitted.

NOTE: A fourth and fifth symbol are provided for additional information and are shown in Appendix 6, part A of the ITU Radio Regulations. Use of the fourth and fifth symbol is optional. Therefore, the symbols may be used as described in Appendix 6, but are not required by the Commission.

(c) First Symbol—types of modulation of the main carrier:

(1) Emission of an unmodulated carrier	N
(2) Emission in which the main carrier is amplitude-modulated (including cases where sub-carriers are angle-modulated):	
—Double-sideband	A
—Single-sideband, full carrier	H
—Single-sideband, reduced or variable level carrier	R
—Single-sideband, suppressed carrier	J
—Independent sidebands	B
—Vestigial sideband	C
(3) Emission in which the main carrier is angle-modulated:	
—Frequency modulation	F
—Phase modulation	G

NOTE: Whenever frequency modulation ''F'' is indicated, Phase modulation ''G'' is also acceptable.

(4) Emission in which the main carrier is amplitude and angle-modulated either simultaneously or in a pre-established sequence	D
(5) Emission of pulses:[1]	
—Sequence of unmodulated pulses	P
—A sequence of pulses:	
—Modulated in amplitude	K
—Modulated in width/duration	L

—Modulated in position/phase	M
—In which the carrier is angle-modulated during the period of the pulse	Q
—Which is a combination of the foregoing or is produced by other means	V
(6) Cases not covered above, in which an emission consists of the main carrier modulated, either simultaneously or in a pre-established sequence, in a combination of two or more of the following modes: amplitude, angle, pulse	W
(7) Cases not otherwise covered	X

[1] Emissions where the main carrier is directly modulated by a signal which has been coded into quantized form (e.g. pulse code modulation) should be designated under (2) or (3).

(d) Second Symbol—nature of signal(s) modulating the main carrier:

(1) No modulating signal	0
(2) A single channel containing quantized or digital information without the use of a modulating sub-carrier, excluding time-division muliplex	1
(3) A single channel containing quantized or digital information with the use of a modulating sub-carrier, excluding time-division multiplex	2
(4) A single channel containing analogue information	3
(5) Two or more channels containing quantized or digital information	7
(6) Two or more channels containing analogue information	8
(7) Composite system with one or more channels containing quantized or digital information, together with one or more channels containing analogue information	9
(8) Cases not otherwise covered	X

(e) Third Symbol—type of information to be transmitted:[2]

(1) No information transmitted	N
(2) Telegraphy—for aural reception	A
(3) Telegraphy—for automatic reception	B
(4) Facsimile	C
(5) Data transmission, telemetry, telecommand	D
(6) Telephony (including sound broadcasting)	E
(7) Television (video)	F
(8) Combination of the above	W
(9) Cases not otherwise covered	X

(f) Type *B* emission: As an exception to the above principles, damped waves are symbolized in the Commission's rules and regulations as type *B* emission. The use of type B emissions is forbidden.

(g) Whenever the full designation of an emission is necessary, the symbol for that emission, as given above, shall be preceded by the necessary bandwidth of the emission as indicated in § 2.202(b)(1).

[49 FR 48697, Dec. 14, 1984]

[2] In this context the word ''information'' does not include information of a constant, unvarying nature such as is provided by standard frequency emissions, continuous wave and pulse radars, etc.

§ 2.202 Bandwidths.

(a) *Occupied bandwidth.* The frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission. In some cases, for example multichannel frequency-division systems, the percentage of 0.5 percent may lead to certain difficulties in the practical application of the definitions of occupied and necessary bandwidth; in such cases a different percentage may prove useful.

(b) *Necessary bandwidth.* For a given class of emission, the minimum value of the occupied bandwidth sufficient to ensure the transmission of information at the rate and with the quality required for the system employed, under specified conditions. Emissions useful for the good functioning of the receiving equipment as, for example, the emission corresponding to the carrier of reduced carrier systems, shall be included in the necessary bandwidth.

(1) The necessary bandwidth shall be expressed by three numerals and one letter. The letter occupies the position of the decimal point and represents the unit of bandwidth. The first character shall be neither zero nor K, M or G.

(2) Necessary bandwidths:

between 0.001 and 999 Hz shall be expressed in Hz (letter H);
between 1.00 and 999 kHz shall be expressed in kHz (letter K);
between 1.00 and 999 MHz shall be expressed in MHz (letter M);
between 1.00 and 999 GHz shall be expressed in GHz (letter G).

(3) Examples:

0.002 Hz—H002	180.4 kHz—180K
0.1 Hz—H100	180.5 kHz—181K
25.3 Hz—25H3	180.7 kHz—181K
400 Hz—400H	1.25 MHz—1M25
2.4 kHz—2K40	2 MHz—2M00
6 kHz—6K00	10 MHz—10M0
12.5 kHz—12K5	202 MHz—202M
	5.65 GHz—5G65

(c) The necessary bandwidth may be determined by one of the following methods:

(1) Use of the formulas included in the table, in paragraph (g) of this section, which also gives examples of necessary bandwidths and designation of corresponding emissions;

(2) For frequency modulated radio systems which have a substantially linear relationship between the value of input voltage to the modulator and the resulting frequency deviation of the carrier and which carry either single sideband suppressed carrier frequency division multiplex speech channels or television, computation in accordance with provisions of paragraph (f) of this section and formulas and methods indicated in the table, in paragraph (g) of this section;

(3) Computation in accordance with Recommendations of the International Radio Consultative Committee (C.C.I.R.);

(4) Measurement in cases not covered by paragraph (c) (1), (2), or (3) of this section.

(d) The value so determined should be used when the full designation of an emission is required. However, the necessary bandwidth so determined is not the only characteristic of an emission to be considered in evaluating the interference that may be caused by that emission.

(e) In the formulation of the table in paragraph (g) of this section, the following terms are employed:

B_n = Necessary bandwidth in hertz

B = Modulation rate in bauds

N = Maximum possible number of black plus white elements to be transmitted per second, in facsimile

M = Maximum modulation frequency in hertz

C = Sub-carrier frequency in hertz

D = Peak frequency deviation, i.e., half the difference between the maximum and minimum values of the instantaneous frequency. The instantaneous frequency in hertz is the time rate of change in phase in radians divided by 2

t = Pulse duration in seconds at half-amplitude

t_r = Pulse rise time in seconds between 10% and 90% of maximum amplitude

K = An overall numerical factor which varies according to the emission and which depends upon the allowable signal distortion.

N_c = Number of baseband telephone channels in radio systems employing multichannel multiplexing

P = Continuity pilot sub-carrier frequency (Hz) (continuous signal utilized to verify performance of frequency-division multiplex systems).

(f) Determination of values of *D* and B_n for systems specified in paragraph (c)(2) of this section:

(1) Determination of *D* in systems for multichannel telephony:

(i) The rms value of the per-channel deviation for the system shall be specified. (In the case of systems employing preemphasis or phase modulation, this value of per-channel deviation shall be specified at the characteristic baseband frequency.)

(ii) The value of D is then calculated by multiplying the rms value of the per-channel deviation by the appropriate factors, as follows:

Number of message circuits	Multiplying factors	Limits of X (P_{avg} (dBmO))
More than 3, but less than 12	4.47 × [a factor specified by the equipment manufacturer or station licensee, subject to Commission approval].	
At least 12, but less than 60	$\frac{3.76 \text{ antilog } (X+2 \log_{10} N_c)}{20}$	X: −2 to +2.6.
At least 60, but less than 240	$\frac{3.76 \text{ antilog } (X+4 \log_{10} N_c)}{20}$	X: −5.6 to −1.0.
240 or more	$\frac{3.76 \text{ antilog } (X+10 \log_{10} N_c)}{20}$	X: −19.6 to −15.0.

Where X represents the average power in a message circuit in dBmO; N_c is the number of circuits in the multiplexed message load; 3.76 corresponds to a peak load factor of 11.5 dB.

(2) The necessary bandwidth (B_n) normally is considered to be numerically equal to:

(i) $2M+2DK$, for systems having no continuity pilot subcarrier or having a continuity pilot subcarrier whose frequency is not the highest modulating the main carrier;

(ii) $2P+2DK$, for systems having a continuity pilot subcarrier whose frequency exceeds that of any other signal modulating the main carrier, unless

the conditions set forth in paragraph (f)(3) of this section are met.

(3) As an exception to paragraph (f)(2)(ii) of this section, the necessary bandwidth (B_n) for such systems is numerically equal to $2P$ or $2M+2DK$, whichever is greater, provided the following conditions are met:

(i) The modulation index of the main carrier due to the continuity pilot subcarrier does not exceed 0.25, and

(ii) In a radio system of multichannel telephony, the rms frequency deviation of the main carrier due to the continuity pilot subcarrier does not exceed 70 percent of the rms value of the per-channel deviation, or, in a radio system for television, the rms deviation of the main carrier due to the pilot does not exceed 3.55 percent of the peak deviation of the main carrier.

(g) Table of necessary bandwidths:

Description of emission	Necessary bandwidth		Designation of emission
	Formula	Sample calculation	
I. NO MODULATING SIGNAL			
Continuous wave emission.			N0N (zero)
II. AMPLITUDE MODULATION			
1. Signal With Quantized or Digital Information			
Continuous wave telegraphy.	B_n=BK, K=5 for fading circuits, K=3 for non-fading circuits	25 words per minute; B=20, K=5, Bandwidth: 100 Hz	100HA1A
Telegraphy by on-off keying of a tone modulated carrier.	B_n=BK+2M, K=5 for fading circuits, K=3 for non-fading circuits	25 words per minute; B=20, M=1000, K=5, Bandwidth: 2100 Hz=2.1 kHz	2K10A2A
Selective calling signal, single-sideband full carrier.	B_n=M	Maximum code frequency is: 2110 Hz, M=2110, Bandwidth: 2110 Hz=2.11 kHz	2K11H2B
Direct-printing telegraphy using a frequency shifted modulating sub-carrier single-sideband suppressed carrier.	B_n=2M+2DK, M=B÷2	B=50, D=35 Hz (70 Hz shift), K=1.2, Bandwidth: 134 Hz	134HJ2B
Telegraphy, single sideband reduced carrier.	B_n=central frequency+M+DK, M=B÷2	15 channels; highest central frequency is: 2805 Hz, B=100, D=42.5 Hz (85 Hz shift), K=0.7 Bandwidth: 2.885 Hz=2.885 kHz	2K89R7B
2. Telephony (Commercial Quality)			
Telephony double-sideband.	B_n=2M	M=3000, Bandwidth=6000 Hz=6 kHz	6K00A3E
Telephony, single-sideband, full carrier.	B_n=2M	M=3000, Bandwidth: 3000 Hz=3 kHz	3K00H3E
Telephony, single-sideband suppressed carrier.	B_n=M − lowest modulation frequency	M=3000, lowest modulation frequency is 3000 Hz, 2700 Hz Bandwidth: 2700Hz=2.7 kHz	2K70J3E
Telephony with separate frequency modulated signal to control the level of demodulated speech signal, single-sideband, reduced carrier.	B_n=M	Maximum control frequency is 2990 Hz, M=2990, Bandwidth: 2990 Hz=2.99 kHz	2K99R3E
Telephony with privacy, single-sideband, suppressed carrier (two or more channels).	B_n=N_cM − lowest modulation frequency in the lowest channel	N_c=2, M=3000 lowest modulation frequency is 250 Hz, Bandwidth: 5750 Hz=5.75 kHz	5K75J8E
Telephony, independent sideband (two or more channels).	B_n=sum of M for each sideband	2 channels, M=3000, Bandwidth: 6000 Hz=6 kHz	6K00B8E

Description of emission	Necessary bandwidth		Designation of emission
	Formula	Sample calculation	
3. Sound Broadcasting			
Sound broadcasting, double-sideband.	B_n=2M, M may vary between 4000 and 10000 depending on the quality desired	Speech and music, M=4000, Bandwidth: 8000 Hz= 8 kHz	8K00A3E
Sound broadcasting, single-sideband reduced carrier (single channel).	B_n=M, M may vary between 4000 and 10000 depending on the quality desired	Speech and music, M=4000, Bandwidth: 4000 Hz= 4 kHz	4K00R3E
Sound broadcasting, single-sideband, suppressed carrier.	B_n=M − lowest modulation frequency	Speech and music, M=4500, lowest modulation frequency=50 Hz, Bandwidth: 4450 Hz=4.45 kHz	4K45J3E
4. Television			
Television, vision and sound.	Refer to CCIR documents for the bandwidths of the commonly used television systems	Number of lines=525; Nominal video bandwidth: 4.2 MHz, Sound carrier relative to video carrier=4.5 MHz	5M75C3F
		Total vision bandwidth: 5.75 MHz; FM aural bandwidth including guardbands: 250,000 Hz	250KF3E
		Total bandwidth: 6 MHz	6M25C3F
5. Facsimile			
Analogue facsimile by sub-carrier frequency modulation of a single-sideband emission with reduced carrier.	B_n=C–N÷2+DK, K=1.1 (typically)	N=1100, corresponding to an index of cooperation of 352 and a cycler rotation speed of 60 rpm. Index of cooperation is the product of the drum diameter and number of lines per unit length C=1900, D=400 Hz, Bandwidth=2.890 Hz=2.89 kHz	2K89R3C
Analogue facsimile; frequency modulation of an audio frequency sub-carrier which modulates the main carrier, single-sideband suppressed carrier.	B_n=2M+2DK, M=N/$_2$, K=1.1 (typically)	N=1100, D=400 Hz, Bandwidth: 1980 Hz=1.98 kHz	1K98J3C
6. Composite Emissions			
Double-sideband, television relay.	B_n=2C+2M+2D	Video limited to 5 MHz, audio on 6.5 MHz frequency modulated subcarrier deviation=50 kHz: C=6.5×10^6 D=50×10^3 Hz, M=15,000, Bandwidth: 13.13×10^6 Hz=13.13 MHz	13M2A8W
Double-sideband radio relay system.	B_n=2M	10 voice channels occupying baseband between 1 kHz and 164 kHz; M=164,000 bandwith=328,000 Hz=328 kHz	328KA8E
Double-sideband emission of VOR with voice (VOR=VHF omnidirectional radio range).	B_n=2C_{max}+2M+2DK, K=1 (typically)	The main carrier is modulated by: —a 30 Hz sub-carrier—a carrier resulting from a 9960 Hz tone frequency modulated by a 30 Hz tone—a telephone channel—a 1020 Hz keyed tone for continual Morse identification. C_{max}=9960, M=30, D=480 Hz, Bandwidth: 20,940 Hz=20.94 kHz	20K9A9W
Independent sidebands; several telegraph channels together with several telephone channels.	B_n=sum of M for each sideband	Normally composite systems are operated in accordance with standardized channel arrangements, (e.g. CCIR Rec. 348–2) 3 telephone channels and 15 telegraphy channels require the bandwidth 12,000 Hz=12 kHz	12K0B9W

Description of emission	Necessary bandwidth		Designation of emission
	Formula	Sample calculation	
III–A. FREQUENCY MODULATION			
1. Signal With Quantized or Digital Information			
Telegraphy without error-correction (single channel).	B_n=2M+2DK, M=B÷2, K=1.2 (typically)	B=100, D=85 Hz (170 Hz shift), Bandwidth: 304 Hz	304HF1B
Four-frequency duplex telegraphy.	B_n2M+2DK, B=Modulation rate in bands of the faster channel. If the channels are synchronized: M=B÷2, otherwise M=2B, K=1.1 (typically)	Spacing between adjacent frequencies=400 Hz; Synchronized channels; B=100, M=50, D=600 Hz, Bandwidth: 1420 Hz=1.42 kHz	1K42F7B
2. Telephony (Commercial Quality)			
Commercial telephony ...	B_n=2M+2DK, K=1 (typically, but under conditions a higher value may be necessary	For an average case of commercial telephony, M=3,000, Bandwidth: 16,000 Hz=16 kHz	16K0F3E
3. Sound Broadcasting			
Sound broadcasting	B_n=2M+2DK, K=1 (typically)	Monaural, D=75,000 Hz, M=15,000, Bandwidth: 18,000 Hz=180 kHz	180KF3E
4. Facsimile			
Facsimile by direct frequency modulation of the carrier; black and white.	B_n=2M+2DK, M=N÷2, K=1.1 (typically)	N=1100 elements/sec; D=400 Hz, Bandwidth: 1980 Hz=1.98 kHZ	1K98F1C
Analogue facsimile	B_n=2M+2DK, M=N÷2, K=1.1 (typically)	N=1100 elements/sec; D=400 Hz, Bandwidth: 1980 Hz=1.98 kHz	1K98F3C
5. Composite Emissions (See Table III–B)			
Radio-relay system, frequency division multiplex.	B_n=2P+2DK, K=1	Microwave radio relay system specifications: 60 telephone channels occupying baseband between 60 and 300 kHz; rms per-channel deviation 200 kHz; pilot at 331 kHz produces 200 kHz rms deviation of main carrier. Computation of B_n : D=(200×10³ 3×3.76×1.19), Hz=0.895×10⁶, P=0.331×10⁶ Hz; Bandwidth: 2.452×10⁶ Hz	2M45F8E
Radio-relay system frequency division multiple.	B_n=2M+2DK, K=1	Microwave radio relay relay systems specifications: 1200 telephone channels occupying baseband between 60 and 5564 kHz; rms per channel deviation 200 kHz; continunity pilot at 6199 kHz produces 140 kHz rms deviation of main carrier. Computation of B_n : D=(20⁰×10³× 3.76×3.63)=2.73×10⁶; M=5.64×10⁶Hz; P=6.2×10⁶ Hz; (2M+2DK<2P; Bandwidth 16.59×10⁶ Hz	16M6F8E
Radio-relay system, frequency division multiplex.	B_n=2P	Microwave radio relay system specifications: Multiplex 600 telephone channels occupying baseband between 60 and 2540 kHz; continuity pilot at 8500 kHz produces 140 kHz rms deviation of main carrier. Computation of Bn : D=(200×10³×3.76 × 2.565)=1.93×10⁶ Hz; M=2.54×10⁶ Hz; 2DK)≤2P Bandwidth: 17×10⁶ Hz	17M0F8E

Description of emission	Necessary bandwidth		Designation of emission
	Formula	Sample calculation	
Unmodulated pulse emission.	B_n=2K÷t, K depends upon the ratio of pulse rise time. Its value usually falls between 1 and 10 and in many cases it does not need to exceed 6	Primary Radar Range resolution: 150 m, K=1.5 (triangular pulse where $t \simeq t_r$, only components down to 27 dB from the strongest are considered) Then t=2×range resolution÷velocity of light=2×150÷3×10^8=1×10^{-6} seconds, Bandwidth: 3×10^6 Hz=3 MHz	3M00P0N
6. Composite Emissions			
Radio-relay system	B_n=2K÷t, K=1.6	Pulse position modulated by 36 voice channel baseband; pulse width at half amplitude=0.4 us, Bandwidth: 8×10^6 Hz=8 MHz (Bandwidth independent of the number of voice channels)	8M00M7E

[28 FR 12465, Nov. 22, 1963, as amended at 37 FR 8883, May 2, 1972; 37 FR 9996, May 18, 1972; 48 FR 16492, Apr. 18, 1983; 49 FR 48698, Dec. 14, 1984]

Subpart D—Call Signs and Other Forms of Identifying Radio Transmissions

AUTHORITY: Secs. 4, 5, 303, 48 Stat., as amended, 1066, 1068, 1082; 47 U.S.C. 154, 155, 303.

§ 2.301 Station identification requirement.

Each station using radio frequencies shall identify its transmissions according to the procedures prescribed by the rules governing the class of station to which it belongs with a view to the elimination of harmful interference and the general enforcement of applicable radio treaties, conventions, regulations, arrangements, and agreements in force, and the enforcement of the Communications Act of 1934, as amended, and the Commission's rules.

[34 FR 5104, Mar. 12, 1969]

§ 2.302 Call signs.

The table which follows indicates the composition and blocks of international call signs available for assignment when such call signs are required by the rules pertaining to particular classes of stations. When stations operating in two or more classes are authorized to the same licensee for the same location, the Commission may elect to assign a separate call sign to each station in a different class. (In addition to the U.S. call sign allocations listed below, call sign blocks AAA through AEZ and ALA through ALZ have been assigned to the Department of the Army; call sign block AFA through AKZ has been assigned to the Department of the Air Force; and call sign block NAA through NZZ has been assigned jointly to the Department of the Navy and the U.S. Coast. Guard.

Class of station	Composition of call sign	Call sign blocks
Coast (Class I) except for coast telephone in Alaska.	3 letters	KAA through KZZ. WAA through WZZ.
Coast (Classes II and III) and maritime radiodetermination.	3 letters, 3 digits	KAA200 through KZZ999. WAA200 through WZZ999.
Coast telephone in Alaska	3 letters, 2 digits. 3 letters, 3 digits (for stations assigned frequencies above 30 MHz).	KAA20 through KZZ99. WAA20 through WZZ99. WZZ200 through WZZ999.
Fixed	3 letters, 2 digits	KAA20 through KZZ99.
	3 letters, 3 digits (for stations assigned frequencies above 30 MHz).	WAA20 through WZZ99. WAA200 through WZZ999.
Marine receiver test	3 letters, 3 digits (plus general geographic location when required).	KAA200 through KZZ999. WAA200 through WZZ999.
Ship telegraph	4 letters[1]	KAAA through KZZZ. WAAA through WZZZ.
Ship telephone	2 letters, 4 digits, or 3 letters, 4 digits[1]	WA2000 through WZ9999, through WZZ9999.

Class of station	Composition of call sign	Call sign blocks
Ship telegraph plus telephone	4 letters	KAAA through KZZZ. WAAA through WZZZ.
Ship radar	Same as ship telephone and/or telegraph call sign, or, if ship has no telephone or telegraph: 2 letters, 4 digits, or 3 letters, 4 digits.	WA2000 through WZ9999, through WZZ9999.
Ship survival craft	Call sign of the parent ship followed by 2 digits.	KAAA20 through KZZZ99. WAAA20 through WZZZ99.
Cable-repair ship marker buoy	Call sign of the parent ship followed by the letters ''BT'' and the identifying number of the buoy.	
Marine utility	2 letters, 4 digits	KA2000 through KZ9999.
Shipyard mobile	2 letters, 4 digits	KA2000 through KZ9999.
Aircraft telegraph	5 letters	KAAAA through KZZZZ. WAAAA through WZZZZ.
Aircraft telegraph and telephone	5 letters[2]	KAAAA through KZZZZ. WAAAA through WZZZZ.
Aircraft telephone	5 letters[2] (whenever a call sign is assigned).	KAAAA through KZZZZ. WAAAA through WZZZZ.
Aircraft survival craft	Whenever a call sign[2] is assigned, call sign of the parent aircraft followed by a single digit other than 0 or 1.	
Aeronautical	3 letters, 1 digit[2]	KAA2 through KZZ9. WAA2 through WZZ9.
Land mobile (base)	3 letters, 3 digits	KAA200 through KZZ999. WAA200 through WZZ999
Land mobile (mobile telegraph)	4 letters, 1 digit	KAAA2 through KZZZ9. WAAA2 through WZZZ9.
Land mobile (mobile telephone)	2 letters, 4 digits	KA2000 through KZ9999. WA2000 through WZ9999
Broadcasting (standard)	4 letters[3] (plus location of station)	KAAA through KZZZ. WAAA through WZZZ.
Broadcasting (FM)	4 letters (plus location of station)	KAAA through KZZZ. WAAA through WZZZ.
Broadcasting with suffix ''FM''	6 letters[3] (plus location of station)	KAAA–FM through KZZZ-–FM. WAAA–FM through WZZZ–FM.
Broadcasting (television)	4 letters (plus location of station)	KAAA through KZZZ. WAAA through WZZZ.
Broadcasting with suffix ''TV''	6 letters[3] (plus location of station)	KAAA–TV through KZZZ–TV. WAAA–TV through WZZ–TV.
Television broadcast translator	1 letter—output channel number—2 letters.	K02AA through K83ZZ. W02AA through W83ZZ.
Disaster station, except U.S. Government	4 letters, 1 digit	KAAA2 through KZZZ9. WAAA2 through WZZZ9.
Experimental (letter ''X'' follows the digit)	2 letters, 1 digit, 3 letters	KA2XAA through KZ9XZZ. WA2XAA through WZ9XZZ.
Amateur (letter ''X'' may not follow digit)	1 letter, 1 digit, 1 letter[4]	K1A through K0Z. N1A through N0Z. W1A through W0Z.
Amateur	1 letter, 1 digit, 2 letters[4]	K1AA through K0ZZ. N1AA through N0ZZ. W1AA through W0ZZ.
Do	1 letter, 1 digit, 3 letters[4]	K1AAA through K0ZZZ. N1AAA through N0ZZZ. W1AAA through W0ZZZ.
Do	2 letters, 1 digit, 1 letter[4]	AA1A through AI0Z. KA1A through KZ0Z. NA1A through NZ0Z. WA1A through WZ0Z.
Do	2 letters, 1 digit, 2 letters[4]	AA1AA through AL0ZZ. KA1AA through KZ0ZZ. NA1AA through NZ0ZZ. WA1AA through WZ0ZZ.
Amateur (letter ''X'' may not follow digit)	2 letters, 1 digit, 3 letters[4]	AA1AAA through AL0ZZZ. KA1AAA through KZ0ZZZ. NA1AAA through NZ0ZZZ. WA1AAA through WZ0ZZZ.
Standard frequency		WWV, WWVB through WWVI, WWVL, WWVS.
Personal radio	3 letters, 4 digits, or 4 letters, 4 digits.	KAA0001 through KZZ9999, WAA0001 through WPZ9999, KAAA0001 through KZZZ9999.
Personal radio, temporary permit	3 letters, 5 digits	KAA00000 through KZZ99999.
Personal radio in trust territories.	1 letter, 4 digits	K0001 through K9999.

Class of station	Composition of call sign	Call sign blocks
Business radio temporary permit	2 letters, 7 digits	WT plus local telephone number.
Part 90 temporary permit	2 letters, 7 digits	WT plus local telephone number.
Part 90 conditional permit	2 letters, 7 digits	WT plus local telephone number.
General Mobile Radio Service, temporary permit.	2 letters, 7 digits	WT plus business or residence telephone number.

NOTE: The symbol 0 indicates the digit zero.

[1] Ships with transmitter-equipped survival craft shall be assigned four letter call signs.

[2] See § 2.303.

[3] A 3 letter call sign now authorized for and in continuous use by a licensee of a standard broadcasting station may continue to be used by that station. The same exception applies also to frequency modulation and television broadcasting stations using 5 letter call signs consisting of 3 letters with the suffix "FM" or "TV".

[4] Plus other identifying data as may be specified.

[34 FR 5104, Mar. 12, 1969; as amended at 54 50239, Dec. 5, 1989]

EDITORIAL NOTE: For FEDERAL REGISTER citations affecting § 2.302, see the List of CFR Sections Affected in the Finding Aids section of this volume.

§ 2.303 Other forms of identification of stations.

(a) The following table indicates forms of identification which may be used in lieu of call signs by the specified classes of stations. Such recognized means of identification may be one or more of the following: name of station, location of station, operating agency, official registration mark, flight identification number, selective call number or signal, selective call identification number or signal, characteristic signal, characteristic of emission or other clearly distinguishing form of identification readily recognized internationally. Reference should be made to the appropriate part of the rules for complete information on identification procedures for each service.

Class of station	*Identification, other than assigned call sign*
Aircraft (U.S. registry) telephone	Registration number preceded by the type of the aircraft, or the radiotelephony designator of the aircraft operating agency followed by the flight identification number.
Aircraft (foreign registry) telephone	Foreign registry identification consisting of five characters. This may be preceded by the radiotelephony designator of the aircraft operating agency or it may be preceded by the type of the aircraft.
Aeronautical	Name of the city, area, or airdrome served together with such additional identification as may be required.
Aircraft survival craft	Appropriate reference to parent aircraft, e.g., the air carrier parent aircraft flight number or identification, the aircraft registration number, the name of the aircraft manufacturer, the name of the aircraft owner, or any other pertinent information.
Ship telegraph	When an official call sign is not yet assigned: Complete name of the ship and name of licensee. On 156.65 MHz: Name of ship. Digital selective call.
Ship telegraph	Digital selective call.
Public coast (radiotelephone) and Limited Coast (Radiotelephone).	The approximate geographic location in a format approved by the Commission.
	Coast station identification number.
Public coast (radiotelegraph)	Coast station identification number.
Fixed	Geographic location. When an approved method of superimposed identification is used, QTT DE (abbreviated name of company or station).
Fixed: Rural subscriber service	Assigned telephone number.
Land mobile: Public safety, forestry conservation, highway maintenance, local government, shipyard, land transportation, and aviation services.	Name of station licensee (in abbreviated form if practicable), or location of station, or name of city, area, or facility served. Individual stations may be identified by additional digits following the more general identification.
Land mobile: Industrial service	Mobile unit cochannel with its base station: Unit identifier on file in the base station records. Mobile unit not cochannel with its base station: Unit identifier on file in the base station records and the assigned call sign of either the mobile or base station. Temporary base station: Unit designator in addition to base station identification.
Land mobile: Domestic public and rural radio	Special mobile unit designation assigned by licensee or by assigned telephone number.

Class of station	*Identification, other than assigned call sign*
Land mobile: Railroad radio service	Name of railroad, train number, caboose number, engine number, or name of fixed wayside station or such other number or name as may be specified for use of railroad employees to identify a specific fixed point or mobile unit. A railroad's abbreviated name or initial letters may be used where such are in general usage. Unit designators may be used in addition to the station identification to identify an individual unit or transmitter of a base station.
Land mobile: Broadcasting (remote pickup)	Identification of associated broadcasting station.
Broadcasting (Emergency Broadcast System)	State and operational area identification.
Broadcasting (aural STL and intercity relay)	Call sign of the broadcasting station with which it is associated.
Broadcasting (television auxiliary)	Call sign of the TV broadcasting station with which it is licensed as an auxiliary, or call sign of the TV broadcasting station whose signals are being relayed, or by network identification.
Broadcasting (television booster).	Retransmission of the call sign of the primary station.
Disaster station	By radiotelephony: Name, location, or other designation of station when same as that of an associated station in some other service. Two or more separate units of a station operated at different locations are separately identified by the addition of a unit name, number, or other designation at the end of its authorized means of identification.

(b) Digital selective calls will be authorized by the Commission and will be formed by groups of numbers (0 through 9), however, the first digit must be other than 0, as follows:

(1) Coast station identification number: 4 digits.

(2) Ship station selective call number: 5 digits.

(3) Predetermined group of ship stations: 5 digits.

(c) Ship stations operating under a temporary operating authority shall identify by a call sign consisting of the letter ''K'' followed by the vessel's Federal or State registration number, or a call sign consisting of the letters ''KUS'' followed by the vessel's documentation number. However, if the vessel has no registration number or documentation number, the call sign shall consist of the name of the vessel and the name of the licensee as they appear on the station application form.

[28 FR 12465, Nov. 22, 1963, as amended at 40 FR 57675, Dec. 11, 1975; 41 FR 44042, Oct. 6, 1976; 42 FR 31008, June 17, 1977; 44 FR 62284, Oct. 30, 1979]

Subpart E—Distress, Disaster, and Emergency Communications

§2.401 Distress messages.

Each station licensee shall give absolute priority to radiocommunications or signals relating to ships or aircraft in distress; shall cease all sending on frequencies which will interfere with hearing a radiocommunication or signal of distress and except when engaged in answering or aiding the ship or aircraft in distress, shall refrain from sending any radiocommunications or signals until there is assurance that no interference will be caused with the radiocommunications or signals relating thereto; and shall assist the ship or aircraft in distress, so far as possible, by complying with its instructions.

§2.402 Control of distress traffic.

The control of distress traffic is the responsibility of the mobile station in distress or of the mobile station which, by the application of the provisions of §2.403, has sent the distress call. These stations may, however, delegate the control of the distress traffic to another station.

§2.403 Retransmission of distress message.

Any station which becomes aware that a mobile station is in distress may transmit the distress message in the following cases:

(a) When the station in distress is not itself in a position to transmit the message.

(b) In the case of mobile stations, when the master or the person in charge of the ship, aircraft, or other vehicles carrying the station which intervenes believes that further help is necessary.

(c) In the case of other stations, when directed to do so by the station in control of distress traffic or when it has reason to believe that a distress call which it has intercepted has not been

received by any station in a position to render aid.

§ 2.404 Resumption of operation after distress.

No station having been notified to cease operation shall resume operation on frequency or frequencies which may cause interference until notified by the station issuing the original notice that the station involved will not interfere with distress traffic as it is then being routed or until the receipt of a general notice that the need for handling distress traffic no longer exists.

§ 2.405 Operation during emergency.

The licensee of any station (except amateur, standard broadcast, FM broadcast, noncommercial educational FM broadcast, or television broadcast) may, during a period of emergency in which normal communication facilities are disrupted as a result of hurricane, flood, earthquake, or similar disaster, utilize such station for emergency communication service in communicating in a manner other than that specified in the instrument of authorization: *Provided:*

(a) That as soon as possible after the beginning of such emergency use, notice be sent to the Commission at Washington, D.C., and to the Engineer in Charge of the district in which the station is located, stating the nature of the emergency and the use to which the station is being put, and

(b) That the emergency use of the station shall be discontinued as soon as substantially normal communication facilities are again available, and

(c) That the Commission at Washington, D.C., and the Engineer in Charge shall be notified immediately when such special use of the station is terminated: *Provided further,*

(d) That in no event shall any station engage in emergency transmission on frequencies other than, or with power in excess of, that specified in the instrument of authorization or as otherwise expressly provided by the Commission, or by law: *And provided further,*

(e) That any such emergency communication undertaken under this section shall terminate upon order of the Commission.

NOTE: Part 73 of this chapter contains provisions governing emergency operation of standard, FM, noncommercial educational FM, and television broadcast stations. Part 97 of this chapter contains such provisions for amateur stations.

[28 FR 13785, Dec. 18, 1963]

§ 2.406 National defense; free service.

Any common carrier subject to the Communications Act may render to any agency of the United States Government free service in connection with the preparation for the national defense. Every such carrier rendering any such free service shall make and file, in duplicate, with the Commission, on or before the 31st day of July and on or before the 31st day of January in each year, reports covering the periods of 6 months ending on the 30th day of June and the 31st day of December, respectively, next prior to said dates. These reports shall show the names of the agencies to which free service was rendered pursuant to this rule, the general character of the communications handled for each agency, and the charges in dollars which would have accrued to the carrier for such service rendered to each agency if charges for all such communications had been collected at the published tariff rates.

§ 2.407 National defense; emergency authorization.

The Federal Communications Commission may authorize the licensee of any radio station during a period of national emergency to operate its facilities upon such frequencies, with such power and points of communication, and in such a manner beyond that specified in the station license as may be requested by the Army, Navy, or Air Force.

Subparts F–G [Reserved]

Subpart H—Prohibition Against Eavesdropping

§ 2.701 Prohibition against use of a radio device for eavesdropping.

(a) No person shall use, either directly or indirectly, a device required to be licensed by section 301 of the Communications Act of 1934, as amended, for the purpose of overhearing or

recording the private conversations of others unless such use is authorized by all of the parties engaging in the conversation.

(b) Paragraph (a) of this section shall not apply to operations of any law enforcement officers conducted under lawful authority.

[31 FR 3400, Mar. 4, 1966]

Subpart I—Marketing of Radiofrequency Devices

SOURCE: 35 FR 7898, May 22, 1970, unless otherwise noted.

§2.801 Radiofrequency device defined.

As used in this part, a radiofrequency device is any device which in its operation is capable of emitting radiofrequency energy by radiation, conduction, or other means. Radiofrequency devices include, but are not limited to:

(a) The various types of radio communication transmitting devices described throughout this chapter.

(b) The incidental, unintentional and intentional radiators defined in part 15 of this chapter.

(c) The industrial, scientific, and medical equipment described in part 18 of this chapter.

(d) Any part or component thereof which in use emits radiofrequency energy by radiation, conduction, or other means.

[35 FR 7898, May 22, 1970, as amended at 54 FR 17711, Apr. 25, 1989]

§2.803 Equipment requiring Commission approval.

In the case of a radio frequency device, which, in accordance with the rules in this chapter must be type approved, type accepted, certificated or notified prior to use, no person shall sell or lease, or offer for sale or lease (including advertising for sale or lease) or import, ship or distribute for the purpose of selling or leasing or offering for sale or lease, any such radio frequency device, unless, prior thereto, such devices shall have been type approved, type accepted, certificated or notified as the case may be: *Provided, however,* That the advertising or display of a device, which has not been granted type approval, type acceptance, certification or notification, will not be deemed to be an offer for sale if such advertising contains, and the display is accompanied by, conspicuous notice worded as follows:

> This device has not been approved by the Federal Communications Commission. This device is not, and may not be, offered for sale or lease, or sold or leased until the approval of the FCC has been obtained.

This provision does not apply to radio frequency devices that could not be granted an equipment authorization or be legally operated under our current rules. Such devices shall not be advertised or displayed or offered for sale or lease or sold or leased. *Provided further,* That any non-approved device displayed under the terms of the above provision may not be activated or operated.

[48 FR 3620, Jan. 26, 1983]

§2.805 Equipment that does not require Commission approval.

In the case of a radio frequency device that, in accordance with the rules in this chapter, does not have to have a grant of equipment authorization issued by the Commission, *e.g.*, a device subject to verification or a Declaration of Conformity, but, nevertheless, must comply with specified technical standards prior to use, no person shall sell or lease, or offer for sale or lease (including advertising for sale or lease), or import, ship or distribute for the purposes of selling or leasing or offering for sale or lease, any such radio frequency device unless, prior thereto, such device complies with the applicable administrative and technical provisions (including verification or Declaration of Conformity of the equipment, where required) specified in the Commission's rules.

[61 FR 31045, June 19, 1996]

§2.806 Exemption for a digital device.

(a) Notwithstanding the provisions in §2.805, the announcement and offer for sale of a digital device, subject to verification under the provisions in part 15 of this chapter, that is in the conceptual, developmental, design or preproduction stage is permitted prior to verification of compliance *Provided* the prospective buyer is advised in

writing at the time of announcement or offer for sale that such equipment is subject to the FCC rules and that such equipment shall comply with the appropriate FCC rules before final delivery to the buyer or to centers of distribution.

(b) Parties responsible for verification of Class A digital devices, as defined in part 15 of this chapter, shall have the option of ensuring compliance with the applicable technical specifications of this chapter at each end user's location after installation, provided that the purchase or lease agreement includes a proviso that such a determination of compliance be made and is the responsibility of the party responsible for verification of the equipment.

(c) A digital device subject to the provisions of this chapter may be operated prior to a determination of compliance under the following conditions:

(1) Any digital device may be operated for the purpose of compliance testing.

(2) Any digital device may be operated for the purpose of demonstration at a trade show provided there is displayed a conspicuous notice that the device has not been tested for compliance.

(3) Any digital device may be operated at the manufacturer's facilities during developmental, design or preproduction states for evaluation of product performance and determination of customer acceptability.

(4) Where customer acceptability of a Class A digital device cannot be determined at the manufacturer's facilities because of size or unique capability of the device, that device may be operated at the user's site during development, design or preproduction stages for evaluation of product performance and determination of customer acceptability.

(5) For the purpose of paragraphs (c)(3) and (c)(4) of this section, the manufacturer's facilities are considered to include the facilities of the party responsible for compliance with the regulations, the manufacturer, and other entities working under the authorization of the responsible party in connection with the development and manufacture, but not marketing, of the equipment.

[54 FR 17712, Apr. 25, 1989, as amended at 56 FR 13082, Mar. 29, 1991]

§ 2.807 Statutory exceptions.

As provided by section 302(c) of the Communications Act of 1934, as amended §§ 2.803 and 2.805 shall not be applicable to:

(a) Carriers transporting radiofrequency devices without trading in them.

(b) Radiofrequency devices manufactured solely for export.

(c) The manufacture, assembly, or installation of radiofrequency devices for its own use by a public utility engaged in providing electric service: *Provided, however,* That no such device shall be operated if it causes harmful interference to radio communications.

(d) Radiofrequency devices for use by the Government of the United States or any agency thereof: *Provided, however,* That this exception shall not be applicable to any device after it has been disposed of by such Government or agency.

§ 2.809 Exemption for ISM equipment.

(a) The announcement and offer for sale of ISM equipment which is subject to the provisions of part 18 of this chapter, and which is in the conceptual developmental, design or pre-production stage is permitted prior to determination of compliance, provided the prospective buyer is advised in writing at the time of the announcement or offer for sale that said equipment is subject to FCC Rules and that said equipment shall comply with the appropriate FCC Rules prior to final delivery to the buyer or to the distribution centers.

(b) Manufacturers of nonconsumer ISM equipment shall have the option of insuring compliance with applicable technical specifications of this chapter at each end user's location after installation, provided the purchase or lease agreement includes a proviso that such a determination of compliance be made and is the responsibility of the manufacturer of the equipment.

(c) ISM equipment subject to the provisions of this chapter may be operated prior to determination of compliance

and, when appropriate, obtaining authorization from the Commission under the following circumstances:

(1) While testing for purposes of determining equipment compliance.

(2) When demonstrating equipment at trade shows, provided a conspicuous notice is displayed to specify that the device has not been tested for compliance or approved by the Commission. If the device is offered for sale or lease, the provisions of §2.809(a) shall apply.

(3) While testing at customer's premises to determine equipment acceptability.

[50 FR 36067, Sept. 5, 1985]

§2.811 Transmitters operated under part 73.

Sections 2.803 and 2.805 shall not be applicable to a transmitter operated in any of the Radio Broadcast Services regulated under part 73 of this chapter, provided the conditions set out in part 73 of this chapter for the acceptability of such transmitter for use under licensing are met.

§2.813 Transmitters operated in the Instructional Television Fixed Service.

Sections 2.803 and 2.805 shall not be applicable to a transmitter operated in the Instructional Television Fixed Service regulated under part 74 of this chapter provided the conditions in §74.952 of this chapter for the acceptability of such transmitter for licensing are met.

§2.815 External radio frequency power amplifiers.

(a) As used in this part, an external radio frequency power amplifier is any device which, (1) when used in conjunction with a radio transmitter as a signal source is capable of amplification of that signal, and (2) is not an integral part of a radio transmitter as manufactured.

(b) After April 27, 1978, no person shall manufacture, sell or lease, offer for sale or lease (including advertising for sale or lease), or import, ship, or distribute for the purpose of selling or leasing or offering for sale or lease, any external radio frequency power amplifier or amplifier kit capable of operation on any frequency or frequencies between 24 and 35 MHz.

NOTE: For purposes of this part, the amplifier will be deemed incapable of operation between 24 and 35 MHz if:

(1) The amplifier has no more than 6 decibels of gain between 24 and 26 MHz and between 28 and 35 MHz. (This gain is determined by the ratio of the input RF driving signal (mean power measurement) to the mean RF output power of the amplifier.); and

(2) The amplifier exhibits no amplification (0 decibels of gain) between 26 and 28 MHz.

(c) No person shall manufacture, sell or lease, offer for sale or lease (including advertising for sale or lease) or import, ship or distribute for the purpose of selling or leasing or offering for sale or lease, any external radio frequency power amplifier or amplifier kit capable of operation on any frequency or frequencies below 144 MHz unless the amplifier has received a grant of type acceptance in accordance with subpart J of this part and subpart C of part 97 or other relevant parts of this chapter. No more than 10 external radio frequency power amplifiers or amplifier kits may be constructed for evaluation purposes in preparation for the submission of an application for a grant of type acceptance.

NOTE: For the purposes of this part, an amplifier will be deemed incapable of operation below 144 MHz if the amplifier is not capable of being easily modified to increase its amplification characteristics below 120 MHz, and either:

(1) The mean output power of the amplifier decreases, as frequency decreases from 144 MHz, to a point where 0 decibels or less gain is exhibited at 120 MHz and below 120 MHz; or

(2) The amplifier is not capable of even short periods of operation below 120 MHz without sustaining permanent damage to its amplification circuitry.

(d) The proscription in paragraph (b) of this section shall not apply to the marketing, as defined in that paragraph, by a licensed amateur radio operator to another licensed amateur radio operator of an external radio frequency power amplifier fabricated in not more than one unit of the same model in a calendar year by that operator provided the amplifier is for the amateur operator's personal use at his licensed amateur radio station and the

requirements of §§97.75 and 97.76 of this chapter are met.

(e) The proscription in paragraph (c) of this section shall not apply in the marketing, as defined in that paragraph, by a licensed amateur radio operator to another licensed amateur radio operator of an external radio frequency power amplifier if the amplifier is for the amateur radio operator's personal use at his licensed amateur radio station and the requirements or §§97.75 and 97.76 of this chapter are met.

[40 FR 1246, Jan. 7, 1975; 40 FR 6474, Feb. 12, 1975, as amended at 43 FR 12687, Mar. 27, 1978; 43 FR 33725, Aug. 1, 1978; 46 FR 18981, Mar. 27, 1981]

Subpart J—Equipment Authorization Procedures

SOURCE: 39 FR 5919, Feb. 15, 1974, unless otherwise noted.

GENERAL PROVISIONS

§ 2.901 Basis and purpose.

(a) In order to carry out its responsibilities under the Communications Act and the various treaties and international regulations, and in order to promote efficient use of the radio spectrum, the Commission has developed technical standards for radio frequency equipment and parts or components thereof. The technical standards applicable to individual types of equipment are found in that part of the rules governing the service wherein the equipment is to be operated. In addition to the technical standards provided, the rules governing the service may require that such equipment be verified by the manufacturer or importer, be authorized under a Declaration of Conformity, or receive an equipment authorization from the Commission by one of the following procedures: type approval, type acceptance, certification, registration or notification.

(b) The following sections describe the verification procedure, the procedure for a Declaration of Conformity, and the procedures to be followed in obtaining type approval, type acceptance, certification or notification from the Commission and the conditions attendant to such a grant.

[61 FR 31045, June 19, 1996]

§ 2.902 Verification.

(a) Verification is a procedure where the manufacturer makes measurements or takes the necessary steps to insure that the equipment complies with the appropriate technical standards. Submittal of a sample unit or representative data to the Commission demonstrating compliance is not required unless specifically requested by the Commission pursuant to § 2.957, of this part.

(b) Verification attaches to all items subsequently marketed by the manufacturer or importer which are identical as defined in § 2.908 to the sample tested and found acceptable by the manufacturer.

(Secs. 4, 303, 307, 48 Stat., as amended, 1066, 1082, 1083; 47 U.S.C. 154, 303, 307)

[46 FR 23249, Apr. 24, 1981]

§ 2.903 Type approval.

(a) Type approval is an equipment authorization issued by the Commission based on examination and measurement of one or more sample units by the Commission at its laboratory.

(b) Type approval attaches to all units subsequently marketed by the grantee which are identical (See § 2.908) in all respects to the sample tested by the Commission or include only changes authorized by the Commission pursuant to § 2.967.

[39 FR 5919, Feb. 15, 1974; 39 FR 8617, Mar. 6, 1974, as amended at 39 FR 27802, Aug. 1, 1974]

§ 2.904 Notification.

(a) Notification is an equipment authorization issued by the Commission whereby the applicant makes measurements to determine that the equipment complies with the appropriate technical standards and reports that such measurements have been made and demonstrate the necessary compliance. Submittal of a sample unit or representative data to the Commission demonstrating compliance is not required unless specifically requested by the Commission pursuant to § 2.936, § 2.943 or § 2.945.

(b) Notification attaches to all items subsequently marketed by the grantee which are identical, as defined in §2.908, to the sample(s) tested and found acceptable by the grantee.

(c) Permissive changes or other variations authorized by the Commission to equipment under the notification procedure shall be made in accordance with the restrictions contained in §2.977.

(d) For equipment which requires a grant of notification, authorization under type acceptance, type approval, or certification shall be deemed to constitute authorization of the equipment under notification.

[48 FR 3621, Jan. 26, 1983, as amended at 49 FR 3996, Feb. 1, 1984]

§2.905 Type acceptance.

(a) Type acceptance is an equipment authorization issued by the Commission for equipment to be used pursuant to a station authorization. Type acceptance is based on representations and test data submitted by the applicant.

(b) Type acceptance attaches to all units subsequently marketed by the grantee which are identical (See §2.908) to the sample tested except for permissive changes or other variations authorized by the Commission pursuant to §2.1001.

[39 FR 5919, Feb. 15, 1974; 39 FR 8617, Mar. 6, 1974, as amended at 39 FR 27802, Aug. 1, 1974]

§2.906 Declaration of Conformity.

(a) A Declaration of Conformity is a procedure where the responsible party, as defined in §2.909, makes measurements or takes other necessary steps to ensure that the equipment complies with the appropriate technical standards. Submittal of a sample unit or representative data to the Commission demonstrating compliance is not required unless specifically requested pursuant to §2.1076.

(b) The Declaration of Conformity attaches to all items subsequently marketed by the responsible party which are identical, as defined in §2.908, to the sample tested and found acceptable by the responsible party.

[61 FR 31045, June 19, 1996]

§2.907 Certification.

(a) Certification is an equipment authorization issued by the Commission for equipment designed to be operated without individual license under Parts 15 and 18 of its rules, based on representations and test data submitted by the applicant.

(b) Certification attaches to all units subsequently marketed by the grantee which are identical (see §2.908) to the sample tested except for permissive changes or other variations authorized by the Commission pursuant to §2.1043.

[39 FR 5919, Feb. 15, 1974, as amended at 39 FR 27802, Aug. 1, 1974]

§2.908 Identical defined.

As used in this subpart, the term *identical* means identical within the variation that can be expected to arise as a result of quantity production techniques.

(Secs. 4, 303, 307, 48 Stat., as amended, 1066, 1082, 1083; 47 U.S.C. 154, 303, 307)

[46 FR 23249, Apr. 24, 1981]

§2.909 Responsible party.

The following parties are responsible for the compliance of radio frequency equipment with the applicable standards:

(a) In the case of equipment which requires the issuance by the Commission of a grant of equipment authorization, the party to whom that grant of authorization is issued (the grantee).

(b) In the case of equipment subject to authorization under the verification procedure, the manufacturer or, in the case of imported equipment, the importer.

(c) In the case of equipment subject to authorization under the Declaration of Conformity procedure:

(1) The manufacturer or, if the equipment is assembled from individual component parts and the resulting system is subject to authorization under a Declaration of Conformity, the assembler.

(2) If the equipment, by itself, is subject to a Declaration of Conformity and that equipment is imported, the importer.

[54 FR 17712, Apr. 25, 1989, as amended at 61 FR 31045, June 19, 1996]

APPLICATION PROCEDURES FOR EQUIPMENT AUTHORIZATIONS

§ 2.911 Written application required.

(a) An application for equipment authorization shall be filed on a form prescribed by the Commission.

(b) Each application shall be accompanied by all information required by this subpart and by those parts of the rules governing operation of the equipment, and by requisite test data, diagrams, etc., as specified in this subpart and in those sections of rules whereunder the equipment is to be operated.

(c) Each application including amendments thereto, and related statements of fact required by the Commission, shall be personally signed by the applicant if the applicant is an individual; by one of the partners if the applicant is a partnership; by an officer, if the applicant is a corporation; or by a member who is an officer, if the applicant is an unincorporated association: *Provided, however,* That the application may be signed by the applicant's authorized representative who shall indicate his title, such as plant manager, project engineer, etc.

(d) Technical test data shall be signed by the person who performed or supervised the tests. The person signing the test data shall attest to the accuracy of such data. The Commission may require such person to submit a statement showing that he is qualified to make or supervise the required measurements.

(e) The signatures of the applicant and the person certifying the test data shall be made personally by those persons on the original application; copies of such documents may be conformed. Signatures and certifications need not be made under oath.

(f) Each application shall be accompanied by the processing fee prescribed in subpart G of part 1 of this chapter.

[39 FR 5919, Feb. 15, 1974, as amended at 39 FR 27802, Aug. 1, 1974; 52 FR 5294, Feb. 20, 1987. Redesignated at 54 FR 17712, Apr. 25, 1989]

§ 2.913 Submittal of equipment authorization application or information to the Commission.

(a) Unless otherwise directed, applications with fees attached for the equipment authorization, pursuant to § 1.1103 of this chapter, must be submitted to the Federal Communications Commission, Equipment Approval Services, P.O. Box 358315, Pittsburgh, PA 15251–5315. If the applicant chooses to make use of an air courier/package delivery service, the following address must appear on the outside of the package/envelope: Federal Communications Commission, c/o Mellon Bank, Three Mellon Bank Center, 525 William Penn Way, 27th floor, Room 153–2713, Pittsburgh, Pennsylvania 15259–0001, attention: Wholesale Lockbox Supervisor.

(b) Any information or equipment samples requested by the Commission pursuant to the provisions of subpart J of this part shall, unless otherwise directed, be submitted to the FCC, Equipment Authorization Division, 7434 Oakland Mills Road, Columbia, Maryland 21046.

[61 FR 31045, June 19, 1996]

§ 2.915 Grant of application.

(a) The Commission will grant an application for type approval, type acceptance, certification or notification if it finds from an examination of the application and supporting data, or other matter which it may officially notice, that:

(1) The equipment is capable of complying with pertinent technical standards of the rule part(s) under which it is to be operated; and,

(2) A grant of the application would serve the public interest, convenience and necessity.

(b) Grants will be made in writing showing the effective date of the grant and any special condition(s) attaching to the grant.

(c) Neither type approval, type acceptance, certification or notification shall attach to any equipment, nor shall any equipment authorization be

deemed effective, until the application has been granted.

[39 FR 5919, Feb. 15, 1974, as amended at 48 FR 3621, Jan. 26, 1983]

§2.917 Dismissal of application.

(a) An application which is not in accordance with the provisions of this subpart may be dismissed.

(b) Any application, upon written request signed by the applicant or his attorney, may be dismissed prior to a determination granting or denying the authorization requested.

(c) If an applicant is requested by the Commission to file additional documents or information and fails to submit the requested material within 60 days, the application may be dismissed.

(d) An application for type approval which has been accepted by the Commission in which the equipment required to be tested is not received by the Commission's Laboratory within six months following the date of the application, may be dismissed.

§2.919 Denial of application.

If the Commission is unable to make the findings specified in §2.915(a), it will deny the application. Notification to the applicant will include a statement of the reasons for the denial.

§2.921 Hearing on application.

Whenever it is determined that an application for equipment authorization presents substantial factual questions relating to the qualifications of the applicant or the equipment (or the effects of the use thereof), the Commission may designate the application for hearing. A hearing on an application for an equipment authorization shall be conducted in the same manner as a hearing on a radio station application as set out in subpart B of part 1 of this chapter.

§2.923 Petition for reconsideration; application for review.

Persons aggrieved by virtue of an equipment authorization action may file with the Commission a petition for reconsideration or an application for review. Rules governing the filing of petitions for reconsideration and applications for review are set forth in §§1.106 and 1.115, respectively, of this chapter.

§2.924 Marketing of electrically identical equipment having multiple trade names and models or type numbers under the same FCC Identifier.

The grantee of an equipment authorization may market devices having different model/type numbers, or trade names without additional authorization provided such devices are electrically identical and the equipment bears an FCC Identifier validated by a grant of equipment authorization.

[54 FR 1698, Jan. 17, 1989]

§2.925 Identification of equipment.

(a) Each equipment covered in an application for equipment authorization shall bear a nameplate or label listing the following:

(1) FCC Identifier consisting of the two elements in the exact order specified in §2.926. The FCC Identifier shall be preceded by the term *FCC ID* in capital letters on a single line, and shall be of a type size large enough to be legible without the aid of magnification.

EXAMPLE: FCC ID XXX123. XXX—Grantee Code 123—Equipment Product Code

(2) Any other statements or labeling requirements imposed by the rules governing the operation of the specific class of equipment, except that such statement(s) of compliance may appear on a separate label at the option of the applicant/grantee.

(3) Equipment subject only to registration will be identified pursuant to part 68 of this chapter.

(b) Any device subject to more than one equipment authorization procedure may be assigned a single FCC Identifier. However, a single FCC Identifier is required to be assigned to any device consisting of two or more sections assembled in a common enclosure, on a common chassis or circuit board, and with common frequency controlling circuits. Devices to which a single FCC Identifier has been assigned shall be identified pursuant to paragraph (a) of this section.

(1) Separate FCC Identifiers may be assigned to a device consisting of two

or more sections assembled in a common enclosure, but constructed on separate sub-units or circuit boards with independent frequency controlling circuits. The FCC Identifier assigned to any transmitter section shall be preceded by the term *TX FCC ID*, the FCC Identifier assigned to any receiver section shall be preceded by the term *RX FCC ID* and the identifier assigned to any remaining section(s) shall be preceded by the term *FCC ID*.

(2) Where telephone equipment subject to part 68 of this chapter, and a radiofrequency device subject to equipment authorization requirements are assembled in a common enclosure, the nameplate/label shall display the FCC Registration Number in the format specified in part 68 and the FCC Identifier in the format specified in paragraph (a) of this section.

(3) Applications filed on or after May 1, 1981, and applications filed earlier requesting equipment authorization using the single system of identification pursuant to section (a)(1) will receive a review of the identification portion by the Commission's Laboratory with respect to nameplate/label design within 30 days after receipt at the Laboratory. Failure by the Laboratory to reject a nameplate design proposed in any particular application within this time period will constitute de-facto acceptance of the nameplate/label design for that particular equipment. Such de facto acceptance will be limited to the equipment covered by the particular application and will not be considered to establish a precedent for other applications. This review deadline applies only to the proposed nameplate/label design, not to the remainder of the application.

(4) For a transceiver, the receiver portion of which is subject to verification pursuant to §15.69(c) of this chapter, the FCC Identifier required for the transmitter portion shall be preceded by the term *FCC ID:*.

(c) [Reserved]

(d) The nameplate or label shall be permanently affixed to the equipment and shall be readily visible to the purchaser at the time of purchase.

(1) As used here, ''permanently affixed'' means that the required nameplate data is etched, engraved, stamped, indelibly printed, or otherwise permanently marked on a permanently attached part of the equipment enclosure. Alternatively, the required information may be permanently marked on a nameplate of metal, plastic, or other material fastened to the equipment enclosure by welding, riveting, etc., or with a permanent adhesive. Such a nameplate must be able to last the expected lifetime of the equipment in the environment in which the equipment will be operated and must not be readily detachable.

(2) As used here, ''readily visible'' means that the nameplate or nameplate data must be visible from the outside of the equipment enclosure. It is preferable that it be visible at all times during normal installation or use, but this is not a prerequisite for grant of equipment authorization.

(e) Where it is shown that a permanently affixed nameplate is not desirable or is not feasible, an alternative method of positively identifying the equipment may be used if approved by the Commission. The proposed alternative method of identification and the justification for its use must be included with the application for equipment authorization.

NOTE: As an example, a device intended to be implanted within the body of a test animal or person would probably require an alternate method of identification.

(f) The term: ''FCC ID:'' and the coded identification assigned by the Commission shall be in a size of type large enough to be readily legible, consistent with the dimensions of the equipment and its nameplate. However, the type size for the FCC Identifier is not required to be larger than eight-point.

(g) Unless assigned an FCC Identifier pursuant to §2.925 (a) and (a)(1), each equipment for which an equipment authorization application is filed before May 1, 1981, shall be uniquely identified with a name and type or model number inscribed on a nameplate or label. The detailed information to be inscribed on the nameplate or label is set out in the rules for the particular form of equipment authorization required, and for some kinds of equipments, in the rules

governing the specific category of devices. The type or model number required for equipment subject to this paragraph shall comply with the following requirements:

(1) The type or model number shall consist of a series of Arabic numerals or capital letters or a combination thereof, and may include punctuation marks and spaces. The total of Arabic numerals, capital letters, punctuation marks and spaces in any assigned type or model number shall not exceed 17;

(2) The type or model number will be specified in the grant of equipment authorization and will be identical to that assigned by the manufacturer or applicant and given in the application for equipment authorization;

(3) The type or model number shall be one which has not been used previously in conjunction with the same name that will be on the equipment.

[44 FR 17177, Mar. 21, 1979, as amended at 44 FR 55574, Sept. 27, 1979; 46 FR 21013, Apr. 8, 1981; 52 FR 21687, June 9, 1987; 54 FR 1698, Jan. 17, 1989]

§2.926 FCC identifier.

(a) A grant of equipment authorization issued by the Commission will list the validated FCC Identifier consisting of the grantee code assigned by the FCC pursuant to paragraph (b) of this section, and the equipment product code assigned by the grantee pursuant to paragraph (c) of this section. See §2.925.

(b) The grantee code assigned pursuant to paragraph (c) of this section is assigned permanently to applicants/grantees and is valid only for the party specified as the applicant/grantee in the code assignment(s).

(c) A grantee code will have three characters consisting of Arabic numerals, capital letters, or combination thereof. A prospective grantee or his authorized representative may submit a written request to the Commission for assignment of a grantee code at any time. However, it is preferred that grantee codes be requested prior to filing applications for equipment authorization. If a grantee code is not requested in advance, one will be assigned at the time an application is received by the FCC Laboratory and the applicant will be notified to make any necessary label revisions in order to comply fully with application procedural rules.

(1) After assignment of a grantee code each grantee will continue to use the same grantee code for subsequent equipment authorization applications.

In the event the grantee name is changed or ownership is transferred, the circumstances shall be reported to the Commission so that a new grantee code can be assigned, if appropriate. See §§2.934 and 2.935 for additional information.

(2) [Reserved]

(d) The equipment product code assigned by the grantee shall consist of a series of Arabic numerals, capital letters or a combination thereof, and may include the dash or hyphen (-). The total of Arabic numerals, capital letters and dashes or hyphens shall not exceed 14 and shall be one which has not been previously used in conjunction with:

(1) The same grantee code, or

(2) An application denied pursuant to §2.919 of this chapter.

(e) No FCC Identifier may be used on equipment to be marketed unless that specific identifier has been validated by a grant of equipment authorization issued by the Commission. This shall not prohibit placement of an FCC identifier on a transceiver which includes a verified receiver subject to §15.69, provided that the transmitter portion of such transceiver is covered by a valid grant of type acceptance or certification. The FCC Identifier is uniquely assigned to the grantee and may not be placed on the equipment without authorization by the grantee. See §2.803 for conditions applicable to the display at trade shows of equipment which has not been granted equipment authorization where such grant is required prior to marketing. Labelling of such equipment may include model or type numbers, but shall not include a purported FCC Identifier.

[44 FR 17179, Mar. 21, 1979, as amended at 46 FR 21014, Apr. 8, 1981; 52 FR 21687, June 9, 1987; 54 FR 1698, Jan. 17, 1989]

CONDITIONS ATTENDANT TO AN EQUIPMENT AUTHORIZATION

§ 2.927 Limitations on grants.

(a) A grant of an equipment authorization is effective until revoked or withdrawn, rescinded, surrendered, or a termination date is otherwise established by the Commission.

(b) A grant of an equipment authorization signifies that the Commission has determined that the equipment has been shown to be capable of compliance with the applicable technical standards if no unauthorized change is made in the equipment and if the equipment is properly maintained and operated. The issuance of an equipment authorization should not be construed as a finding by the Commission with respect to matters not encompassed by the Commission's rules.

(c) No person shall, in any advertising matter, brochure, etc., use or make reference to an equipment authorization in a deceptive or misleading manner or convey the impression that such equipment authorization reflects more than a Commission determination that the device or product has been shown to be capable of compliance with the applicable technical standards of the Commission's rules.

(d) The issuance of an equipment authorization for a wireless microphone reflects no more than a Commission determination that the device has been shown to be capable of compliance with the applicable technical standards of the Commission's Rules, and should not be construed as a finding by the Commission as to matters not encompassed by the rules, especially with respect to compliance with 18 U.S.C. 2512.

[39 FR 5919, Feb. 15, 1974, as amended at 44 FR 29066, May 18, 1979]

§ 2.929 Nonassignability of an equipment authorization.

(a) An equipment authorization issued by the Commission may not be assigned, exchanged or in any other way transferred to a second party.

(b) The grantee of an equipment authorization may license or otherwise authorize a second party to manufacture or market the equipment covered by the grant of the equipment authorization provided:

(1) The equipment manufactured by such second party bears the identical name and number as is set out in the grant of the equipment authorization.

NOTE: Any change in the name or number desired as a result of such production or marketing agreement will require the filing of a new application for an equipment authorization as specified in § 2.933.

(2) The grantee of the equipment authorization shall continue to be responsible to the Commission for the equipment produced pursuant to such an agreement.

[39 FR 5919, Feb. 15, 1974, as amended at 54 FR 1699, Jan. 17, 1989]

§ 2.931 Responsibility of the grantee.

In accepting a grant of an equipment authorization the grantee warrants that each unit of equipment marketed under such grant and bearing the identification specified in the grant will conform to the unit that was measured and that the data (design and rated operational characteristics) determined by the grantee for notification, filed with the application for type acceptance or certification, or measured by the Commission in the case of type approved equipment, continues to be representative of the equipment being produced under such grant within the variation that can be expected due to quantity production and testing on a statistical basis.

[48 FR 3621, Jan. 26, 1983]

§ 2.932 Modification of equipment.

(a) A new application for an equipment authorization shall be filed whenever there is a change in the design, circuitry or construction of an equipment or device for which an equipment authorization has been issued, except as provided in paragraphs (b), (c), (d) and (e) of this section.

(b) Permissive changes may be made in a type accepted equipment pursuant to § 2.1001.

(c) Permissive changes may be made in a certificated equipment pursuant to § 2.1043.

(d) For changes in type approved equipment the procedure in § 2.967 shall apply.

(e) Permissive changes may be made in notified equipment pursuant to §2.977.

[39 FR 5919, Feb. 15, 1974, as amended at 48 FR 3621, Jan. 26, 1983]

§2.933 Change in identification of equipment.

(a) A new application for equipment authorization shall be filed whenever there is a change in the identification of the equipment with or without a change in design, circuitry or construction. However, for electrically identical equipment, a change in type or model number will not be considered to by a change in identification, and will not require a new application for equipment authorization.

(b) An application filed pursuant to paragraph (a) of this section where no change in design, circuitry or construction is involved, need not be accompanied by a resubmission of equipment or measurement or test data customarily required with a new application, unless specifically requested by the Commission. In lieu thereof, the applicant shall attach a statement setting out:

(1) The original identification used on the equipment prior to the change in identification.

(2) The date of the original grant of the equipment authorization.

(3) The original type approval number assigned by the Commission, if one was assigned.

(4) How the equipment bearing the modified identification differs from the original equipment.

(5) Whether the data previously filed with the Commission (or measured by the Commission in the case of type approved equipment or measured by the applicant in the case of notified equipment) continues to be representative of and applicable to the equipment bearing the changed identification.

(6) In the case of type accepted equipment, the photographs required by §2.983(f).

(7) In the case of certificated equipment, the photographs required by §2.1033(c).

(c) If the change in identification also involves a change in design or circuitry which falls outside the purview of a permissive change described in §2.977, §2.1001 or §2.1043, a complete application shall be filed pursuant to §2.909.

[39 FR 5919, Feb. 15, 1974, as amended at 48 FR 3621, Jan. 26, 1983; 51 FR 39535, Oct. 29, 1986]

§2.934 Change in name and/or address of grantee.

Whenever there is a change in the name and/or address of the grantee of an equipment authorization, written notice of such change(s) shall be filed within 30 days after the grantee starts using the new name and/or address, in order for the Commission to update its records of grantee names, addresses and grantee codes. See §2.910(b).

[54 FR 1699, Jan. 17, 1989]

§2.935 Change in control of grantee.

In the case of a transfer of control of the grantee of an equipment authorization, as in the case of sale or merger of the grantee, notice of such transfer must be received by the Commission not later than 60 days subsequent to the consummation of the agreement effecting the transfer of control. Depending on the circumstances in each case, the Commission may require new applications for equipment authorization for each device or equipment held by the predecessor in interest, production of which will be continued by the acquiring party.

§2.936 FCC inspection.

Each grantee of an equipment authorization shall upon reasonable request, submit the following to the Commission or shall make the following available for inspection:

(a) The device or equipment covered by the grant of equipment authorization.

(b) The record of design drawings and specifications required by §2.938(a).

(c) The record of the procedures used for production inspection and testing required by §2.938(a)(2).

(d) The manufacturing plant and facilities.

[39 FR 5919, Feb. 15, 1974, as amended at 51 FR 39535, Oct. 29, 1986]

§ 2.937 Equipment defect and/or design change.

When a complaint is filed with the Commission concerning the failure of equipment subject to this chapter to comply with pertinent requirements of the Commission's rules, and the Commission determines that the complaint is justified and arises out of an equipment fault attributable to the responsible party, the Commission may require the responsible party to investigate such complaint and report the results of such investigation to the Commission. The report shall also indicate what action if any has been taken or is proposed to be taken by the responsible party to correct the defect, both in terms of future production and with reference to articles in the possession of users, sellers and distributors.

[61 FR 31046, June 19, 1996]

§ 2.938 Retention of records.

(a) For each equipment for which an equipment authorization has been issued, the grantee shall maintain the records listed below:

(1) A record of the original design drawings and specifications and all changes that have been made that may affect compliance with the requirements of § 2.931.

(2) A record of the procedures used for production inspection and testing to insure the conformance required by § 2.931.

(3) For equipment covered under the notification procedure, a record of the test results that demonstrate compliance with the appropriate regulations.

(b) The provisions of paragraph (a) of this section shall also apply to a manufacturer of equipment produced under an FCC equipment authorization pursuant to a license, purchase or other contractural agreements between said manufacturer and the grantee of the equipment authorization. Retention of records by said manufacturer in these circumstances shall satisfy the grantee's responsibility under paragraph (a) of this section.

(c) The records listed in paragraph (a) of this section shall be retained for one year after the manufacture of said equipment item has been permanently discontinued, or until the conclusion of an investigation or a proceeding if the grantee (or under paragraph (b) of this section the manufacturer) is officially notified that an investigation or any other administrative proceeding involving his equipment has been instituted.

(d) The records required to be retained by paragraph (a) of this section shall apply only to equipment for which the equipment authorization was issued on or after September 1, 1974 or for which the license, purchase or other contractual agreement in paragraph (b) of this section was signed on or after September 1, 1974.

[39 FR 27802, Aug. 1, 1974, as amended at 48 FR 3621, Jan. 26, 1983]

§ 2.939 Revocation or withdrawal of equipment authorization.

(a) The Commission may revoke any equipment authorization:

(1) For false statements or representations made either in the application or in materials or response submitted in connection therewith or in records required to be kept by § 2.938.

(2) If upon subsequent inspection or operation it is determined that the equipment does not conform to the pertinent technical requirements or to the representations made in the original application.

(3) If it is determined that changes have been made in the equipment other than those authorized by the rules or otherwise expressly authorized by the Commission.

(4) Because of conditions coming to the attention of the Commission which would warrant it in refusing to grant an original application.

(b) Revocation of an equipment authorization shall be made in the same manner as revocation of radio station licenses.

(c) The Commission may withdraw any equipment authorization in the event of changes in its technical standards. The procedure to be followed will be set forth in the order promulgating such new technical standards (after appropriate rulemaking proceedings) and will provide a suitable amortization period for equipment in hands of users and in the manufacturing process.

[39 FR 5919, Feb. 15, 1974, as amended at 51 FR 39535, Oct. 29, 1986]

§2.941 Availability of information relating to grants.

(a) Grants of equipment authorization, other than for receivers and equipment authorized for use under part 15 or 18 of this chapter, will be publicly announced in a timely manner by the Commission. Information about a receiver authorization or about the authorization of a specific model of equipment under parts 15 or 18 of this chapter may be obtained by contacting the Commission's Office of Engineering and Technology.

(b) Information relating to equipment authorizations such as data submitted by the applicant in connection with an authorization application, laboratory tests of the device, etc., shall be available in accordance with §0.457 of this chapter.

[39 FR 5919, Feb. 15, 1974, as amended at 48 FR 3621, Jan. 26, 1983; 51 FR 12616, Apr. 14, 1986]

§2.943 Submission of equipment for testing.

(a) The Commission may require an applicant for type acceptance, certification or notification to submit one or more sample units for measurement at the Commission's laboratory.

(b) In the event the applicant believes that shipment of the sample to the Commission's laboratory is impractical because of the size or weight of the equipment, or the power requirement, or for any other reason, the applicant may submit a written explanation why such shipment is impractical and should not be required.

[39 FR 5919, Feb. 15, 1974, as amended at 48 FR 3621, Jan. 26, 1983]

§2.945 Sampling tests of equipment compliance.

The Commission will, from time to time, request the responsible party to submit equipment subject to this chapter to determine the extent to which subsequent production of such equipment continues to comply with the data filed by the applicant (or on file with the responsible party for equipment subject to notification or a Declaration of Conformity). Shipping costs to the Commission's laboratory and return shall be borne by the responsible party.

[61 FR 31046, June 19, 1996]

§2.946 Penalty for failure to provide test samples and data.

(a) Any responsible party, as defined in §2.909, or any party who markets equipment subject to the provisions of this chapter, shall provide test sample(s) or data upon request by the Commission. Failure to comply with such a request with the time frames shown below may be cause for forfeiture, pursuant to §1.80 of this chapter, or other administrative sanctions such as suspending action on any applications for equipment authorization submitted by such party while the matter is being resolved.

(1) When the equipment is subject to authorization under a Declaration of Conformity, data shall be provided within 14 days of delivery of the request and test sample(s) shall be provided within 60 days of delivery of the request.

(2) For all other devices, test sample(s) or data shall be provided within 60 days of the request.

(b) In the case of equipment involving harmful interference or safety of life or property, the Commission may specify that test samples subject to the provisions of this section be submitted within less than 60 days, but not less than 14 days. Failure to comply within the specified time period will be subject to the sanctions specified in paragraph (a) of this section.

(c) The Commission may consider extensions of time upon submission of a showing of good cause.

[54 FR 1699, Jan. 17, 1989, as amended at 61 FR 31046, June 19, 1996]

§2.947 Measurement procedure.

(a) The Commission will accept data which have been measured in accordance with the following standards or measurement procedures:

(1) Those set forth in bulletins or reports prepared by the Commission's Office of Engineering and Technology. These will be issued as required, and specified in the particular part of the rules where applicable.

(2) Those acceptable to the Commission and published by national engineering societies such as the Electronic Industries Association, the Institute of Electrical and Electronic Engineers, Inc., and the American National Standards Institute.

(3) Any measurement procedure acceptable to the Commission may be used to prepare data demonstrating compliance with the requirements of this chapter.

(b) Information submitted pursuant to paragraph (a) of this section shall completely identify the specific standard or measurement procedure used.

(c) In the case of equipment requiring measurement procedures not specified in the references set forth in paragraphs (a) (1) and (2) of this section, the applicant shall submit a detailed description of the measurement procedures actually used.

(d) A listing of the test equipment used shall be submitted.

(e) If deemed necessary, the Commission may require additional information concerning the measurement procedures employed in obtaining the data submitted for equipment authorization purposes.

[42 FR 44987, Sept. 8, 1977, as amended at 44 FR 39181, July 5, 1979; 51 FR 12616, Apr. 14, 1986]

§ 2.948 Description of measurement facilities.

(a) Each party making measurements of equipment that is subject to an equipment authorization under part 15 or part 18 of this chapter, regardless of whether the measurements are filed with the Commission or kept on file by the party responsible for compliance of equipment marketed within the U.S. or its possessions, shall compile a description of the measurement facilities employed.

(1) If the measured equipment is subject to the verification procedure, the description of the measurement facilities shall be retained by the party responsible for verification of the equipment.

(i) If the equipment is verified through measurements performed by an independent laboratory, it is acceptable for the party responsible for verification of the equipment to rely upon the description of the measurement facilities retained by or placed on file with the Commission by that laboratory. In this situation, the party responsible for verification of the equipment is not required to retain a duplicate copy of the description of the measurement facilities.

(ii) If the equipment is verified based on measurements performed at the installation site of the equipment, no specific site calibration data is required. It is acceptable to retain the description of the measurement facilities at the site at which the measurements were performed.

(2) If the equipment is to be authorized by the Commission under the certification or the notification procedure, the description of the measurement facilities shall be filed with the Commission's Laboratory in Columbia, Maryland. The data describing the measurement facilities need only be filed once but must be updated as changes are made to the measurement facilities or as otherwise described in this section. At least every three years, the organization responsible for filing the data with the Commission shall certify that the data on file is current.

(3) If the equipment is to be authorized under a Declaration of Conformity, the description of the measurement facilities shall be retained by the party performing the measurements.

(b) The description shall contain the following information:

(1) Location of the test site.

(2) Physical description of the test site accompanied by photographs of size A4 (21 cm×29.7 cm) or 8×10 inches (20.3 cm×25.4 cm). Smaller photographs may be used if they clearly show the details of the test site and are mounted on full size sheets of paper.

(3) A drawing showing the dimensions of the site, physical layout of all supporting structures, and all structures within 5 times the distance between the measuring antenna and the device being measured.

(4) Description of structures used to support the device being measured and the test instrumentation.

(5) List of measuring equipment used.

(6) Information concerning the calibration of the measuring equipment, i.e., the date the equipment was last

calibrated and how often the equipment is calibrated.

(7) If desired, a statement as to whether the test site is available to do measurement services for the public on a fee basis.

(8) A plot of site attenuation data.

(i) For a measurement facility that will be used for testing radiated emissions from a digital device on or after May 1, 1994, or for testing intentional and other unintentional radiators authorized under part 15 of the rules on or after June 1, 1995, the site attenuation data shall be taken pursuant to the procedures contained in Sections 5.4.6 through 5.5 of the following procedure: American National Standards Institute (ANSI) C63.4–1992, entitled ''Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz,'' published by the Institute of Electrical and Electronics Engineers, Inc. on July 17, 1992 as document number SH15180. This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Copies of ANSI C63.4–1992 may be obtained from: IEEE Standards Department, 455 Hoes Lane, P.O. Box 1331, Piscataway, NJ 08855–1331, telephone 1–800–678–4333. Copies of ANSI C63.4–1992 may be inspected at the following locations:

(A) Federal Communications Commission, 2025 M Street, NW., Office of Engineering and Technology (room 7317), Washington, DC 20554,

(B) Federal Communications Commission Laboratory, 7435 Oakland Mills Road, Columbia, MD 21046, or

(C) Office of the Federal Register, 800 North Capitol Street, NW., suite 700, Washington, DC.

(ii) For a measurement facility that will be used for testing radiated emissions from a digital device prior to May 1, 1994, or from intentional and other unintentional radiators authorized under part 15 prior to June 1, 1995, or from devices authorized under part 18 of the rules, the site attenuation data shall be taken pursuant to either ANSI C63.4–1992, Sections 5.4.6 through 5.5, or FCC/OET Bulletin 55.

(iii) This requirement does not apply to equipment that is not measured on an open field test site.

(9) A description of the types of equipment intended to be measured or other information regarding the types of measurements that would be performed at the test facility.

(c) The Commission will publish a list of those parties who have filed the information required by this section, provided they indicate that they wish to perform measurement services for the public on a fee basis. However, it should be noted that the Commission does not endorse or approve any facility on this list.

(d) If the equipment is to be authorized under a Declaration of Conformity, the party performing the measurements shall be accredited for performing such measurements by an authorized accreditation body based on the International Organization for Standardization/International Electrotechnical Commission (ISO/IEC) Guide 25, ''General Requirements for the Competence of Calibration and Testing Laboratories.'' Accreditation bodies must be approved by the FCC's Office of Engineering and Technology, as indicated in § 0.241 of this chapter, to perform such accreditation based on ISO/IEC 58, ''Calibration and Testing Laboratory Accreditation Systems—General Requirements for Operation and Recognition.'' The frequency for revalidation of the test site and the information required to be filed or retained by the testing party shall comply with the requirements established by the accrediting organization.

NOTE TO PARAGRAPH (D): Parties that are located outside of the United States or its possessions will be accredited only if there is a mutual recognition agreement between that country and the United States that permits similar accreditation of U.S. facilities to perform testing for products marketed in that country.

[54 FR 17712, Apr. 25, 1989, as amended at 57 FR 24990, June 12, 1992; 58 FR 37430, July 12, 1993; 58 FR 44893, Aug. 25, 1993; 61 FR 31046, June 19, 1996]

VERIFICATION

AUTHORITY: Sections 2.951 through 2.957 are issued under secs. 4, 303, 307, 48 Stat., as amended, 1066, 1082, 1083; 47 U.S.C. 154, 303, 307.

SOURCE: Sections 2.951 through 2.957 appear at 46 FR 23249, Apr. 24, 1981, unless otherwise noted.

§ 2.951 Cross reference.

The provisions of § 2.901, *et seq.*, shall apply to equipment subject to verification.

§ 2.952 Limitation on verification.

(a) Verification signifies that the manufacturer or importer has determined that the equipment has been shown to be capable of compliance with the applicable technical standards if no unauthorized change is made in the equipment and if the equipment is properly maintained and operated. Compliance with these standards shall not be construed to be a finding by the manufacturer or importer with respect to matters not encompassed by the Commission's rules.

(b) Verification of the equipment by the manufacturer or importer is effective until a termination date is otherwise established by the Commission.

(c) No person shall, in any advertising matter, brochure, etc., use or make reference to a verification in a deceptive or misleading manner or convey the impression that such verification reflects more than a determination by the manufacturer or importer that the device or product has been shown to be capable of compliance with the applicable technical standards of the Commission's rules.

§ 2.953 Responsibility of manufacturer or importer.

(a) In verifying compliance, the manufacturer or importer (in the case of imported equipment) warrants that each unit of equipment marketed under the verification procedure will conform to the unit tested and found acceptable by the manufacturer or importer and that data on file with the manufacturer or importer continues to be representative of the equipment being produced under such verification within the variation that can be expected due to quantity production and testing on a statistical basis.

(b) The importer of equipment subject to verification may upon receiving a written statement from the manufacturer that the equipment complies with the appropriate technical standards rely on the manufacturer or independent testing agency to verify compliance. The test records required by § 2.955 however should be in the English language and made available to the Commission upon a reasonable request.

(c) In the case of transfer of control of equipment, as in the case of sale or merger of the grantee, the new manufacturer or importer shall bear the responsibility of continued compliance of the equipment.

(d) Equipment verified by the manufacturer or importer shall be reverified if the modification or change adversely affects the emanation characteristics of the modified equipment. The manufacturer or importer continues to bear the responsibility for continued compliance of subsequently produced equipment.

§ 2.954 Identification.

Devices subject only to verification shall be uniquely identified by the person responsible for marketing or importing the equipment within the United States. However, the identification shall not be of a format which could be confused with the FCC Identifier required on certificated, notified, type accepted or type approved equipment. The importer or manufacturer shall maintain adequate identification records to facilitate positive identification for each verified device.

[54 FR 1699, Jan. 17, 1989]

§ 2.955 Retention of records.

(a) For each equipment subject to verification, the manufacturer (or importer) shall maintain the records listed below:

(1) A record of the original design drawings and specifications and all changes that have been made that may affect compliance with the requirements of § 2.953.

(2) A record of the procedures used for production inspection and testing (if tests were performed) to insure the conformance required by § 2.953. (Statistical production line emission testing is not required.)

(3) A record of the measurements made on an appropriate test site that demonstrates compliance with the applicable regulations. The record shall

identify the measurement procedure that was used and shall include all the data required to show compliance with the appropriate regulations.

(4) For equipment subject to the provisions in part 15 of this chapter, the records shall indicate if the equipment was verified pursuant to the transition provisions contained in §15.37 of this chapter.

(b) The records listed in paragraph (a) of this section shall be retained for two years after the manufacture of said equipment item has been permanently discontinued, or until the conclusion of an investigation or a proceeding if the manufacturer or importer is officially notified that an investigation or any other administrative proceeding involving his equipment has been instituted.

[54 FR 17713, Apr. 25, 1989]

§2.956 FCC inspection and submission of equipment for testing.

(a) Each manufacturer or importer of equipment subject to verification shall upon receipt of reasonable request submit to the Commission the records required by §2.955.

(b) The Commission may require the manufacturer or importer of equipment subject to verification to submit one or more of sample units for measurements at the Commission's Laboratory.

(c) In the event the manufacturer believes that shipment of the sample to the Commission's Laboratory is impractical because of the size or weight of the equipment, or the power requirement or for any other reason, the applicant may submit a written explanation why such shipment is impractical and should not be required.

§2.957 Sampling tests of equipment compliance.

The Commission will from time to time, request the manufacturer or importer to submit to the FCC Laboratory in Columbia, Maryland, various equipment(s) for which verification has been made, to determine the extent to which subsequently produced units continue to comply with the applicable standards. Shipping costs to the Commission's Laboratory and return shall be borne by the manufacturer or importer.

TYPE APPROVAL

§2.961 Cross reference.

The provisions of this subpart, §2.901 *et seq.*, shall apply to applications for and grant of type approval.

§2.963 Application for type approval.

(a) An application for type approval shall be filed on FCC Form 731 with all questions answered.

(b) The application shall be filed by the party whose name will be placed on the equipment.

(c) If the applicant is not the manufacturer of the equipment, he shall attach a statement explaining the relationship between the applicant and the manufacturer accompanied by a confirming statement from the actual manufacturer.

(d) The applicant shall attach a statement containing a technical description of the equipment sufficiently complete to develop all the factors concerning compliance with the technical standards of the applicable rules. The description should include the information listed below. If an item is not applicable, this should be stated.

(1) Type(s) of emission.

(2) Frequency range.

(3) Range of operating power and description of means provided for variation of operating power.

(4) Maximum power rating as defined in the applicable rules.

(5) The voltages applied to and currents into the several elements of the final radio frequency amplifying device for normal operation over the power range. Indicate whether these voltages and currents are DC or AC.

(6) Function of each electron tube, semiconductor or other active circuit device.

(7) Complete circuit diagram.

(8) *Instruction books.* If the instruction book(s) is not available when the application is filed a set of draft instructions should be provided and the complete instruction book should be submitted as soon as available.

(9) Tune up procedure over the power range or at specific operating power levels.

(10) A description of all circuitry and devices provided for determining and stabilizing frequency.

(11) A description of any circuits or devices employed for suppression of spurious radiation, for limiting modulation, and for limiting the operating power.

(12) A photograph or drawing of the equipment identification plate or label showing the information to be placed thereon.

[39 FR 5919, Feb. 15, 1974, as amended at 39 FR 27802, Aug. 1, 1974; 41 FR 19948, May 14, 1976]

§ 2.965 Submission of equipment for type approval testing.

After an application for type approval has been filed and accepted by the Commission, the applicant will be given instructions concerning the shipment of the equipment to the Commission's Laboratory. After testing is completed, the equipment will be returned to the applicant. Shipping costs to the Commission's Laboratory and return shall be borne by the applicant.

§ 2.967 Changes in type approved equipment.

(a) No mechanical or electrical change whatsoever may be made in a type approved equipment without prior approval by the Commission.

NOTE: Changes only in color of finish, or use of technically equivalent non-critical parts of different manufacture are not considered to be changes within the intent of this section. However, changes in make of critical parts (such as magnetrons) or type of semiconductors or vacuum tubes are considered to be changes requiring approval. In this context the term *critical changes* means those changes that affect the capability of the device to comply with the technical standards of the rules. Any questions as to whether changes require approval or not should be referred to the Laboratory Division for determination.

(b) A grantee desiring to make a change shall file an application on FCC Form 731 accompanied by the appropriate fees.

The grantee shall attach a description of the change(s) and shall indicate whether the change(s) will be made in all units (including previous production) or will be made only in those units produced after the change(s) is authorized.

(c) If the Commission authorizes the change(s) requested, it may require the assignment of new identification pursuant to §§ 2.925 and 2.926 of this chapter.

[39 FR 5919, Feb. 15, 1974, as amended at 39 FR 27802, Aug. 1, 1974; 41 FR 19948, May 14, 1976; 51 FR 39535, Oct. 29, 1986]

§ 2.969 Information required on identification label for type approved equipment.

(a) Each equipment for which a type approval application is filed on or after May 1, 1981, shall bear an identification plate or label pursuant to §§ 2.925 and 2.926. The FCC Identifier for such equipment will be validated by the grant of type approval issued by the Commission.

NOTE: FCC Type Approval Numbers will not be issued for any equipment covered by type approval applications filed on or after the date specified above.

(b) Each equipment for which a type approval application is filed before May 1, 1981, shall have the following information on the identification plate or label.

(1) Name of the grantee of type approval.

(2) The words ''TYPE NO.'' ''or MODEL NO.'' followed by the model number or type number assigned to the equipment by the grantee.

(3) The words ''FCC TYPE APPROVAL NO.'' followed by the type approval number assigned by the FCC if a type approval number has been assigned.

(4) Any other statement or labelling requirements imposed by the rules governing the operation of this equipment.

(Secs. 4, 303, 307, 48 Stat., as amended, 1066, 1082, 1083; sec. 302, 82 Stat. 290 (47 U.S.C. 154, 302, 303, 307))

[44 FR 17179, Mar. 21, 1979, as amended at 45 FR 71356, Oct. 28, 1980]

NOTIFICATION

SOURCE: Sections 2.971 through 2.979 appear at 48 FR 3621, Jan. 26, 1983, unless otherwise noted.

§ 2.971 Cross reference.

The general provisions of this subpart, § 2.901, *et seq.*, shall apply to applications for and grants of notification.

§2.973 Limitations on notification.

Notification is a grant of equipment authorization issued by the Commission that signifies that the applicant has determined that the equipment has been shown to be capable of compliance with the applicable technical standards in the Commission's rules if no unauthorized change is made in the equipment and if the equipment is properly maintained and operated. Compliance with these standards shall not be construed to be a finding by the applicant with respect to matters not encompassed by the Commission's rules.

§2.975 Application for notification.

(a) Subsequent to the determination by the applicant that the equipment complies with the applicable standards, the applicant, who shall retain the responsibility for ensuring that the equipment continues to comply with such standards, shall file a request for the issuance of an equipment authorization on FCC Form 731, for each FCC Identifier, with all questions answered. Where a form item is not applicable, it shall be stated. The application shall be filed in the name of the party to whom the grantee code is assigned (see §2.926 concerning the assignment of identifier codes). The following information shall be included in the filing, either in answer to the questions on the form or as attachments thereto:

(1) Name of the applicant indicating whether the applicant is the manufacturer of the equipment, a vendor other than the manufacturer, a licensee or a prospective licensee. Where the applicant is not the manufacturer of the equipment, the name of the manufacturer shall be stated;

(2) The following technical information:

(i) Type or types of emission (if applicable);

(ii) Frequency range;

(iii) Rated frequency tolerance (if applicable);

(iv) Rated radio frequency power output, if applicable (if variable, give the range) and

(v) If the equipment is a microwave transmitter, an explanation of the type of modulation employed and of the resulting emission.

(3) A statement concerning the intended use of the device including both the type of use for which the device has been designed and the part(s) or subpart(s) of the rules governing the device;

(4) The FCC Identifier of the equipment for which notification is sought (see §2.926) and a photograph or drawing of the equipment identification plate or label showing the information to be placed thereon in accordance with §2.925;

(5) For devices operated under the provisions of part 15 of this chapter, photographs showing the general appearance and the controls available to the user. Photographs should be size A4 (21 cm × 29.7 cm) or 8 × 10 inch (20.3 cm × 25.4 cm). Smaller photographs may be submitted provided they are sharp and clear, show the necessary detail, and are mounted on A4 (21 cm × 29.7 cm) or 8.5. × 11 inch (21.6 cm × 27.9 cm) paper. Line sketches may be submitted in lieu of photographs provided those sketches are sufficiently detailed to allow identification of the equipment. For devices operated under the provisions of any other part and where it is specifically required under the rule section(s) under which the device is to be operated, photographs of the equipment of sufficient clarity to reveal its external appearances and size, both front and back;

(6) A signed statement attesting to the following or its equivalent:

> This equipment has been tested in accordance with the requirements contained in the appropriate Commission regulations. To the best of my knowledge, these tests were performed using measurement procedures consistent with industry or Commission standards and demonstrate that the equipment complies with the appropriate standards. Each unit manufactured, imported or marketed, as defined in the Commission's regulations, will conform to the sample(s) tested within the variations that can be expected due to quantity production and testing on a statistical basis. I further certify that the necessary measurements were made by (state the name and address of the test facility even if your own facility was used).

(7) For equipment subject to the provisions of part 15 of this chapter, the application shall indicate if the equipment is being authorized pursuant to

the transition provisions in § 15.37 of this chapter.

(8) Applications for the notification of receivers contained in frequency converters designed or marketed for use with scanning receivers shall include a statement describing the methods used to comply with the design requirements of § 15.121(a) of this chapter or the marketing requirements of § 15.121(b) of this chapter.

(b) The statement required in paragraph (a)(6) of this section shall be signed pursuant to § 2.909(c).

(c) Upon the satisfactory completion of the necessary testing to determine that the applicable standards are met, the submission of the material required in paragraph (a) of this section and the issuance of a grant of equipment authorization, marketing, as defined in § 2.803, is permitted.

(d) The authorization of the equipment through the notification procedure may be revoked pursuant to § 2.939.

(e) Further information may be requested prior to the issuance of a grant of notification. This information may include measurement data, photographs, circuit diagrams and descriptions, or any other material which may be deemed necessary.

(f) For a composite system that incorporates only devices subject to certification, verification and/or notification and that are contained in a single enclosure, a separate application, FCC Form 731, with the appropriate fee shall be submitted for each type of device within the enclosure. At the option of the applicant, a single FCC identifier may be requested for that system. Fees are based on the number of devices and types of authorizations.

(g) The records of measurement data, measurement procedures, photographs, circuit diagrams, etc. for the device to which the application applies shall be retained for two years after the manufacture of said equipment has been permanently discontinued, or until the conclusion of an investigation or proceeding if the holder of the grant of equipment authorization is officially notified that an investigation or any other administrative proceeding involving the equipment has been instituted.

[48 FR 3621, Jan. 26, 1983, as amended at 49 FR 3996, Feb. 1, 1984; 54 FR 17713, Apr. 25, 1989; 58 FR 25575, Apr. 27, 1993; 58 FR 44893, Aug. 25, 1993]

§ 2.977 Changes in notified equipment.

(a) Under the notification procedure, the grantee warrants that each unit of equipment marketed under the identification specified in the grant of equipment authorization will conform to the unit(s) tested and found acceptable by the grantee and that data on file with the grantee, as required in § 2.938, continues to be representative of the equipment being produced under such notification within the variation that can be expected due to quantity production and testing on a statistical basis.

(b) Changes in the electrical and mechanical construction of equipment requiring an application for, and grant of, notification are permissive, providing that the changes do not cause the equipment to exceed the standards applicable to that equipment.

(c) Permissive changes to transmitters notified for operation under part 73 of this chapter include the following:

(1) The interconnection of a type accepted AM broadcast stereophonic exciter-generator with a notified AM broadcast transmitter in accordance with the manufacturer's instructions and upon completion of measurements showing that the modified transmitter meets the emission limitations applicable thereto.

(2) The interconnection of a utility load management exciter with a notified AM broadcast transmitter in accordance with the manufacturer's instructions and completion of equipment performance measurements showing the transmitter meets the minimum performance requirements applicable thereto.

(3) The addition of TV broadcast subcarrier generators to a notified TV broadcast transmitter or the addition of FM broadcast subcarrier generators to a notified FM broadcast transmitter, provided the transmitter exciter is

designed for subcarrier operation without mechanical or electrical alterations to the exciter or other transmitter circuits.

(4) The addition of TV broadcast stereophonic generators to a notified TV broadcast transmitter or the addition of FM broadcast stereophonic generators to a notified FM broadcast transmitter, provided the transmitter exciter is designed for stereophonic sound operation without mechanical or electrical alterations to the exciter or other transmitter circuits.

(5) The addition of subscription TV encoding equipment for which the FCC has granted advance approval under the provisions of §2.1400 in subpart M and §73.644(c) of part 73 of this chapter to a notified transmitter.

(d) Notwithstanding the provisions of this section, broadcast licensees or permittees are permitted to modify notified transmitters pursuant to §73.1690 of the FCC's Rules.

[48 FR 3621, Jan. 26, 1983, as amended at 49 FR 3996, Feb. 1, 1984; 49 FR 8252, Mar. 6, 1984; 49 FR 27147, July 2, 1984; 51 FR 2706, Jan. 21, 1986; 51 FR 41628, Nov. 18, 1986]

§2.979 Information required on identification label for notified equipment.

Each equipment for which a notification application is filed shall bear an identification plate or label pursuant to §§2.925 and 2.926. The FCC Identifier for such equipment will be validated by the grant of notification.

TYPE ACCEPTANCE

§2.981 Cross reference.

(a) The general provisions of this subpart, §2.901 *et seq.*, shall apply to applications for and grants of type acceptance.

(b) [Reserved]

§2.983 Application for type acceptance.

An application for type acceptance shall be filed on FCC Form 731 by the party whose name will be placed on the equipment and shall include the following information either in answer to the questions on the form or as attachments thereto.

(a) Name of applicant indicating whether the applicant is the manufacturer of the equipment, a vendor other than the manufacturer (include the name of manufacturer), a licensee or a prospective licensee.

(b) Identification of equipment for which type acceptance is sought.

(c) Information whether quantity (more than one) production is planned.

(d) Technical description of the equipment sufficiently complete to develop all the factors concerning compliance with the technical standards of the applicable rule part(s). The description shall include the following items:

(1) Type or types of emission.

(2) Frequency range.

(3) Range of operating power values or specific operating power levels, and description of any means provided for variation of operating power.

(4) Maximum power rating as defined in the applicable part(s) of the rules.

(5) The dc voltages applied to and dc currents into the several elements of the final radio frequency amplifying device for normal operation over the power range.

(6) Function of each electron tube or semiconductor or other active circuit device.

(7) Complete circuit diagrams.

(8) Instruction book(s). If the instruction book is not available when the application is filed, a set of draft instructions should be provided and the complete instruction book should be submitted as soon as available. The Commission may specify a date when the complete instruction book should be submitted to conform this requirement with the regulations of the service under which type acceptance is requested.

(9) Tune-up procedure over the power range, or at specific operating power levels.

(10) A description of all circuitry and devices provided for determining and stabilizing frequency.

(11) A description of any circuits or devices employed for suppression of spurious radiation, for limiting modulation, and for limiting power.

(12) For equipment employing digital modulation techniques, a detailed description of the modulation system to

be used, including the response characteristics (frequency, phase and amplitude) of any filters provided, and a description of the modulating wavetrain, shall be submitted for the maximum rated conditions under which the equipment will be operated.

(e) The data required by §§2.985 through 2.997, inclusive, measured in accordance with the procedures set out in §2.999.

(f) A photograph or drawing of the equipment identification plate or label showing the information to be placed thereon.

(g) Photographs (8″ × 10″) of the equipment of sufficient clarity to reveal equipment construction and layout, including meters, if any, and labels for controls and meters and sufficient views of the internal construction to define component placement and chassis assembly. Insofar as these requirements are met by photographs or drawings contained in instruction manuals supplied with the type acceptance request, additional photographs are necessary only to complete the required showing.

(h) An encoder device used for the generation of the EBS Attention Signal as defined in §73.906 need not comply with paragraphs (d)(1) through (d)(5) inclusive, (d)(9) through (d)(12) inclusive and paragraph (e) of this section. In lieu of these requirements measurements must be submitted showing compliance with §73.940.

(i) The application for type acceptance of an external radio frequency power amplifier under part 97 of this chapter need not be accompanied by the data required by paragraph (e) of this section. In lieu thereof, measurements shall be submitted to show compliance with the technical specifications in subpart C of part 97 of this chapter and such information as required by §2.1005 of this part.

(j) An application for type acceptance of an AM broadcast stereophonic exciter-generator intended for interfacing with existing type-accepted or notified transmitters must include measurements made on a complete stereophonic transmitter. The instruction book required under paragraph (d)(8) of this section must include complete specifications and circuit requirements for interconnecting with existing transmitters. The instruction book must also provide a full description of the equipment and measurement procedures to monitor modulation and to verify that the combination of stereo exciter-generator and transmitter meet the emission limitations of §73.44.

(Secs. 4, 303, 307, 48 Stat., as amended, 1066, 1082, 1083; 47 U.S.C. 154, 303, 307)

[39 FR 5919, Feb. 15, 1974, as amended at 39 FR 27802, Aug. 1, 1974; 39 FR 35664, Oct. 3, 1974; 40 FR 34117, Aug. 14, 1975; 41 FR 19948, May 14, 1976; 43 FR 12687, Mar. 27, 1978; 52 FR 15725, Apr. 30, 1987]

§2.985 Measurements required: RF power output.

(a) For transmitters other than single sideband, independent sideband and controlled carrier radiotelephone, power output shall be measured at the RF output terminals when the transmitter is adjusted in accordance with the tune-up procedure to give the values of current and voltage on the circuit elements specified in §2.983(d)(5). The electrical characteristics of the radio frequency load attached to the output terminals when this test is made shall be stated.

(b) For single sideband, independent sideband, and single channel, controlled carrier radiotelephone transmitters the procedure specified in paragraph (a) of this section shall be employed and, in addition, the transmitter shall be modulated during the test as follows. In all tests, the input level of the modulating signal shall be such as to develop rated peak envelope power or carrier power, as appropriate, for the transmitter.

(1) Single sideband transmitters in the A3A or A3J emission modes—by two tones at frequencies of 400 Hz and 1800 Hz (for 3.0 kHz authorized bandwidth), or 500 Hz and 2100 Hz (3.5 kHz authorized bandwidth), or 500 Hz and 2400 Hz (for 4.0 kHz authorized bandwidth), applied simultaneously, the input levels of the tones so adjusted that the two principal frequency components of the radio frequency signal produced are equal in magnitude.

(2) Single sideband transmitters in the A3H emission mode—by one tone at a frequency of 1500 Hz (for 3.0 kHz authorized bandwidth), or 1700 Hz (for 3.5 kHz authorized bandwidth), or 1900 Hz

(for 4.0 kHz authorized bandwidth), the level of which is adjusted to produce a radio frequency signal component equal in magnitude to the magnitude of the carrier in this mode.

(3) As an alternative to paragraphs (b)(1) and (2) of this section other tones besides those specified may be used as modulating frequencies, upon a sufficient showing of need. However, any tones so chosen must not be harmonically related, the third and fifth order intermodulation products which occur must fall within the —25 dB step of the emission bandwidth limitation curve, the seventh and ninth order intermodulation product must fall within the 35 dB step of the referenced curve and the eleventh and all higher order products must fall beyond the —35 dB step of the referenced curve.

(4) Independent sideband transmitters having two channels by 1700 Hz tones applied simultaneously in both channels, the input levels of the tones so adjusted that the two principal frequency components of the radio frequency signal produced are equal in magnitude.

(5) Independent sideband transmitters having more than two channels by an appropriate signal or signals applied to all channels simultaneously. The input signal or signals shall simulate the input signals specified by the manufacturer for normal operation.

(6) Single-channel controlled-carrier transmitters in the A3 emission mode—by a 2500 Hz tone.

(c) For measurements conducted pursuant to paragraphs (a) and (b) of this section, all calculations and methods used by the applicant for determining carrier power or peak envelope power, as appropriate, on the basis of measured power in the radio frequency load attached to the transmitter output terminals shall be shown. Under the test conditions specified, no components of the emission spectrum shall exceed the limits specified in the applicable rule parts as necessary for meeting occupied bandwidth or emission limitations.

§2.987 Measurements required: Modulation characteristics.

(a) *Voice modulated communication equipment.* A curve or equivalent data showing the frequency response of the audio modulating circuit over a range of 100 to 5000 Hz shall be submitted. For equipment required to have an audio low-pass filter, a curve showing the frequency response of the filter, or of all circuitry installed between the modulation limiter and the modulated stage shall be submitted.

(b) *Equipment which employs modulation limiting.* A curve or family of curves showing the percentage of modulation versus the modulation input voltage shall be supplied. The information submitted shall be sufficient to show modulation limiting capability throughout the range of modulating frequencies and input modulating signal levels employed.

(c) *Single sideband and independent sideband radiotelephone transmitters which employ a device or circuit to limit peak envelope power.* A curve showing the peak envelope power output versus the modulation input voltage shall be supplied. The modulating signals shall be the same in frequency as specified in paragraph (c) of §2.989 for the occupied bandwidth tests.

(d) *Other types of equipment.* A curve or equivalent data which shows that the equipment will meet the modulation requirements of the rules under which the equipment is to be licensed.

§2.989 Measurements required: Occupied bandwidth.

The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission shall be measured under the following conditions as applicable:

(a) Radiotelegraph transmitters for manual operation when keyed at 16 dots per second.

(b) Other keyed transmitters—when keyed at the maximum machine speed.

(c) Radiotelephone transmitters equipped with a device to limit modulation or peak envelope power shall be modulated as follows. For single sideband and independent sideband transmitters, the input level of the modulating signal shall be 10 dB greater than that necessary to produce rated peak envelope power.

(1) Other than single sideband or independent sideband transmitters—when modulated by a 2500 Hz tone at an input level 16 dB greater than that necessary to produce 50 percent modulation. The input level shall be established at the frequency of maximum response of the audio modulating circuit.

(2) Single sideband transmitters in A3A or A3J emission modes—when modulated by two tones at frequencies of 400 Hz and 1800 Hz (for 3.0 kHz authorized bandwidth), or 500 Hz and 2100 Hz (for 3.5 kHz authorized bandwidth), or 500 Hz and 2400 Hz (for 4.0 kHz authorized bandwidth), applied simultaneously. The input levels of the tones shall be so adjusted that the two principal frequency components of the radio frequency signal produced are equal in magnitude.

(3) Single sideband transmitters in the A3H emission mode—when modulated by one tone at a frequency of 1500 Hz (for 3.0 kHz authorized bandwidth), or 1700 Hz (for 3.5 kHz authorized bandwidth), or 1900 Hz (for 4.0 kHz authorized bandwidth), the level of which is adjusted to produce a radio frequency signal component equal in magnitude to the magnitude of the carrier in this mode.

(4) As an alternative to paragraphs (c) (2) and (3) of this section, other tones besides those specified may be used as modulating frequencies, upon a sufficient showing of need. However, any tones so chosen must not be harmonically related, the third and fifth order intermodulation products which occur must fall within the —25 dB step of the emission bandwidth limitation curve, the seventh and ninth order products must fall within the —35 dB step of the referenced curve and the eleventh and all higher order products must fall beyond the —35 dB step of the referenced curve.

(5) Independent sideband transmitters having two channels—when modulated by 1700 Hz tones applied simultaneously to both channels. The input levels of the tones shall be so adjusted that the two principal frequency components of the radio frequency signal produced are equal in magnitude.

(d) Radiotelephone transmitters without a device to limit modulation or peak envelope power shall be modulated as follows. For single sideband and independent sideband transmitters, the input level of the modulating signal should be that necessary to produce rated peak envelope power.

(1) Other than single sideband or independent sideband transmitters—when modulated by a 2500 Hz tone of sufficient level to produce at least 85 percent modulation. If 85 percent modulation is unattainable, the highest percentage modulation shall be used.

(2) Single sideband transmitters in A3A or A3J emission modes—when modulated by two tones at frequencies of 400 Hz and 1800 Hz (for 3.0 kHz authorized bandwidth), or 500 Hz and 2100 Hz (for 3.5 kHz authorized bandwidth), or 500 Hz and 2400 Hz (for 4.0 kHz authorized bandwidth), applied simultaneously. The input levels of the tones shall be so adjusted that the two principal frequency components of the radio frequency signal produced are equal in magnitude.

(3) Single sideband transmitters in the A3H emission mode—when modulated by one tone at a frequency of 1500 Hz (for 3.0 kHz authorized bandwidth), or 1700 Hz (for 3.5 kHz authorized bandwidth), or 1900 Hz (for 4.0 kHz authorized bandwidth), the level of which is adjusted to produce a radio frequency signal component equal in magnitude to the magnitude of the carrier in this mode.

(4) As an alternative to paragraphs (d) (2) and (3) of this section, other tones besides those specified may be used as modulating frequencies, upon a sufficient showing of need. However any tones so chosen must not be harmonically related, the third and fifth order intermodulation products which occur must fall within the —25 dB step of the emission bandwidth limitation curve, the seventh and ninth order products must fall within the —35 dB step of the referenced curve and the eleventh and all higher order products must fall beyond the —35 dB step of the referenced curve.

(5) Independent sideband transmitters having two channels—when modulated by 1700 Hz tones applied simultaneously to both channels. The input levels of the tones shall be so adjusted

that the two principal frequency components of the radio frequency signal produced are equal in magnitude.

(e) Transmitters for use in the Radio Broadcast Services:

(1) AM broadcast transmitters for monaural operation—when amplitude modulated 85% by a 7,500 Hz input signal.

(2) AM broadcast stereophonic operation—when the transmitter operated under any stereophonic modulation condition not exceeding 100% on negative peaks and tested under the conditions specified in § 73.128 in part 73 of the FCC rules for AM broadcast stations.

(3) FM broadcast transmitter not used for multiplex operation—when modulated 85 percent by a 15 kHz input signal.

(4) FM broadcast transmitters for multiplex operation under Subsidiary Communication Authorization (SCA)—when carrier is modulated 70 percent by a 15 kHz main channel input signal, and modulated an additional 15 percent simultaneously by a 67 kHz subcarrier (unmodulated).

(5) FM broadcast transmitter for stereophonic operation—when modulated by a 15 kHz input signal to the main channel, a 15 kHz input signal to the stereophonic subchannel, and the pilot subcarrier simultaneously. The input signals to the main channel and stereophonic subchannel each shall produce 38 percent modulation of the carrier. The pilot subcarrier should produce 9 percent modulation of the carrier.

(6) Television broadcast monaural transmitters—when modulated 85% by a 15 kHz input signal.

(7) Television broadcast stereophonic sound transmitters—when the transmitter is modulated with a 15 kHz input signal to the main channel and the stereophonic subchannel, any pilot subcarrier(s) and any unmodulated auxiliary subcarrier(s) which may be provided. The signals to the main channel and the stereophonic subchannel must be representative of the system being tested and when combined with any pilot subcarrier(s) or other auxiliary subcarriers shall result in 85% deviation of the maximum specified aural carrier deviation.

(f) Transmitters for which peak frequency deviation (D) is determined in accordance with § 2.202(f), and in which the modulating baseband comprises more than 3 independent speech channels—when modulated by a test signal determined in accordance with the following:

(1) A modulation reference level is established for the characteristic baseband frequency. (Modulation reference level is defined as the average power level of a sinusoidal test signal delivered to the modulator input which provides the specified value of per-channel deviation.)

(2) Modulation reference level being established, the total rms deviation of the transmitter is measured when a test signal consisting of a band of random noise extending from below 20 kHz to the highest frequency in the baseband, is applied to the modulator input through any preemphasis networks used in normal service. The average power level of the test signal shall exceed the modulation reference level by the number of decibels determined using the appropriate formula in the following table:

Number of message circuits that modulate the transmitter	Number of dB by which the average power (P_{avg}) level test signal shall exceed the modulation reference level	Limits of P_{avg} (dBm0)
More than 3, but less than 12	To be specified by the equipment manufacturer subject to FCC approval.	
At least 12, but less than 60	$X+2 \log_{10} N_c$	X: −2 to +2.6
At least 60, but less than 240	$X+4 \log_{10} N_c$	X: −5.6 to −1.0
240 or more	$X+10 \log_{10} N_c$	X: −19.6 to −15.0

Where X represents the average power in a message circuit in dBm0; N_c is the number of circuits in the multiplexed message load. P_{avg} shall be selected by the transmitter manufacturer and included with the technical data submitted with the application for type acceptance. (See § 2.202(e) in this chapter.)

(g) Transmitters in which the modulating baseband comprises not more than three independent channels—when modulated by the full complement of signals for which the transmitter is rated. The level of modulation for each channel should be set to that prescribed in rule parts applicable to the services for which the transmitter is intended. If specific modulation levels are not set forth in the rules, the tests should provide the manufacturer's maximum rated condition.

(h) Transmitters employing digital modulation techniques—when modulated by an input signal such that its amplitude and symbol rate represent the maximum rated conditions under which the equipment will be operated. The signal shall be applied through any filter networks, pseudo-random generators or other devices required in normal service. Additionally, the occupied bandwidth shall be shown for operation with any devices used for modifying the spectrum when such devices are optional at the discretion of the user.

(i) Transmitters designed for other types of modulation—when modulated by an appropriate signal of sufficient amplitude to be representative of the type of service in which used. A description of the input signal should be supplied.

(Secs. 4, 303, 307, 48 Stat., as amended, 1066, 1082, 1083; 47 U.S.C. 154, 303, 307)

[39 FR 5919, Feb. 15, 1974, as amended at 39 FR 35664, Oct. 3, 1974; 47 FR 13164, Mar. 29, 1982; 48 FR 16493, Apr. 18, 1983; 49 FR 18105, Apr. 27, 1984]

§ 2.991 Measurements required: Spurious emissions at antenna terminals.

The radio frequency voltage or powers generated within the equipment and appearing on a spurious frequency shall be checked at the equipment output terminals when properly loaded with a suitable artificial antenna. Curves or equivalent data shall show the magnitude of each harmonic and other spurious emission that can be detected when the equipment is operated under the conditions specified in § 2.989 as appropriate. The magnitude of spurious emissions which are attenuated more than 20 dB below the permissible value need not be specified.

§ 2.993 Measurements required: Field strength of spurious radiation.

(a) Measurements shall be made to detect spurious emissions that may be radiated directly from the cabinet, control circuits, power leads, or intermediate circuit elements under normal conditions of installation and operation. Curves or equivalent data shall be supplied showing the magnitude of each harmonic and other spurious emission. For this test, single sideband, independent sideband, and controlled carrier transmitters shall be modulated under the conditions specified in paragraph (c) of § 2.989, as appropriate. For equipment operating on frequencies below 890 MHz, an open field test is normally required, with the measuring instrument antenna located in the far-field at all test frequencies. In the event it is either impractical or impossible to make open field measurements (e.g. a broadcast transmitter installed in a building) measurements will be accepted of the equipment as installed. Such measurements must be accompanied by a description of the site where the measurements were made showing the location of any possible source of reflections which might distort the field strength measurements. Information submitted shall include the relative radiated power of each spurious emission with reference to the rated power output of the transmitter, assuming all emissions are radiated from halfwave dipole antennas.

(b) The measurements specified in paragraph (a) of this section shall be made for the following equipment:

(1) Those in which the spurious emissions are required to be 60 dB or more below the mean power of the transmitter.

(2) All equipment operating on frequencies higher than 25 MHz.

(3) All equipment where the antenna is an integral part of, and attached directly to the transmitter.

(4) Other types of equipment as required, when deemed necessary by the Commission.

§ 2.995 Measurements required: Frequency stability.

(a) The frequency stability shall be measured with variation of ambient temperature as follows:

(1) From −30° to +50° centigrade for all equipment except that specified in paragraphs (a)(2) and (3) of this section.

(2) From −20° to +50° centrigrade for equipment to be licensed for use in the Maritime Services under part 80 of this chapter, except for Class A, B, and S Emergency Position Indicating Radiobeacons (EPIRBS), and equipment to be licensed for use above 952 MHz at operational fixed stations in all services, stations in the Local Television Transmission Service and Point-to-Point Microwave Radio Service under part 21 of this chapter, and equipment licensed for use aboard aircraft in the Aviation Services under part 87 of this chapter.

(3) From 0° to +50° centigrade for equipment to be licensed for use in the Radio Broadcast Services under part 73 of this chapter.

(b) Frequency measurements shall be made at the extremes of the specified temperature range and at intervals of not more than 10° centigrade through the range. A period of time sufficient to stabilize all of the components of the oscillator circuit at each temperature level shall be allowed prior to frequency measurement. The short term transient effects on the frequency of the transmitter due to keying (except for broadcast transmitters) and any heating element cycling normally occurring at each ambient temperature level also shall be shown. Only the portion or portions of the transmitter containing the frequency determining and stabilizing circuitry need be subjected to the temperature variation test.

(c) In addition to all other requirements of this section, the following information is required for equipment incorporating heater type crystal oscillators to be used in mobile stations, for which type acceptance is first requested after March 25, 1974, except for battery powered, hand carried, portable equipment having less than 3 watts mean output power.

(1) Measurement data showing variation in transmitter output frequency from a cold start and the elapsed time necessary for the frequency to stabilize within the applicable tolerance. Tests shall be made after temperature stabilization at each of the ambient temperature levels; the lower temperature limit, 0° centigrade and +30° centigrade with no primary power applied.

(2) Beginning at each temperature level specified in paragraph (c)(1) of this section, the frequency shall be measured within one minute after application of primary power to the transmitter and at intervals of no more than one minute thereafter until ten minutes have elapsed or until sufficient measurements are obtained to indicate clearly that the frequency has stabilized within the applicable tolerance, whichever time period is greater. During each test, the ambient temperature shall not be allowed to rise more than 10° centigrade above the respective beginning ambient temperature level.

(3) The elapsed time necessary for the frequency to stabilize within the applicable tolerance from each beginning ambient temperature level as determined from the tests specified in this paragraph shall be specified in the instruction book for the transmitter furnished to the user.

(4) When it is impracticable to subject the complete transmitter to this test because of its physical dimensions or power rating, only its frequency determining and stabilizing portions need be tested.

(d) The frequency stability shall be measured with variation of primary supply voltage as follows:

(1) Vary primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment.

(2) For hand carried, battery powered equipment, reduce primary supply voltage to the battery operating end point which shall be specified by the manufacturer.

(3) The supply voltage shall be measured at the input to the cable normally provided with the equipment, or at the power supply terminals if cables are not normally provided. Effects on frequency of transmitter keying (except for broadcast transmitters) and any heating element cycling at the nominal supply voltage and at each extreme also shall be shown.

(e) When deemed necessary, the Commission may require tests of frequency stability under conditions in addition

to those specifically set out in paragraphs (a), (b), (c), and (d) of this section. (For example measurements showing the effect of proximity to large metal objects, or of various types of antennas, may be required for portable equipment.)

[39 FR 5919, Feb. 14, 1974, as amended at 51 FR 31304, Sept. 2, 1986; 56 FR 11682, Mar. 20, 1991]

§ 2.997 Frequency spectrum to be investigated.

(a) In all of the measurements set forth in §§ 2.991 and 2.993, the spectrum shall be investigated from the lowest radio frequency signal generated in the equipment, without going below 9 kHz, up to at least the frequency shown below:

(1) If the equipment operates below 10 GHz: to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.

(2) If the equipment operates at or above 10 GHz and below 30 GHz: to the fifth harmonic of the highest fundamental frequency or to 100 GHz, whichever is lower.

(3) If the equipment operates at or above 30 GHz: to the fifth harmonic of the highest fundamental frequency or to 200 GHz, whichever is lower.

(b) Particular attention should be paid to harmonics and subharmonics of the carrier frequency as well as to those frequencies removed from the carrier by multiples of the oscillator frequency. Radiation at the frequencies of multiplier stages should also be checked.

(c) The amplitude of spurious emissions which are attenuated more than 20 dB below the permissible value need not be reported.

(d) Unless otherwise specified, measurements above 40 GHz shall be performed using a minimum resolution bandwidth of 1 MHz.

[61 FR 14502, Apr. 2, 1996]

§ 2.999 Measurement procedure.

The measurement procedures employed shall be in accordance with the requirements set forth in § 2.947. In addition, any specific test requirements set forth in the particular rules governing the equipment for which type acceptance is requested shall apply.

[42 FR 44987, Sept. 8, 1977]

§ 2.1001 Changes in type accepted equipment.

(a) Equipment of the same type is defined for purposes of type acceptance as being equipment which is electrically and mechanically interchangeable and in addition will have the same basic tube or semiconductor lineup, frequency multiplication, basic frequency determining and stabilizing circuitry, basic modulator circuit and maximum power rating. Variations in electrical and mechanical construction, other than the items indicated above are permitted provided the variation or change is made in compliance with the requirements of paragraphs (b), (c), and (d) of this section.

(b) Two classes of permissive changes may be made in type accepted equipment without requiring a new application for and grant of type acceptance.

(1) A Class I permissive change includes those modifications in the equipment which do not change the equipment characteristics beyond the rated limits established by the manufacturer and accepted by the Commission when type acceptance is granted, and which do not change the type of equipment as defined in paragraph (a) of this section. No filing with the Commission is required for a Class I permissive change.

(2) A Class II permissive change includes those modifications which bring the performance of the equipment outside the manufacturer's rated limits as originally filed but not below the minimum requirements of the applicable rules, and do not change the type of equipment as defined in paragraph (a) of this section. When a Class II permissive change is made by the grantee, he shall supply the Commission with complete information and results of tests of the characteristics affected by such change. The modified equipment shall not be marketed under the existing grant of type acceptance prior to acknowledgement by the Commission that the change is acceptable.

(3) When a Class II permissive change is made by other than the grantee of type acceptance, the information and

data specified in paragraph (b)(2) of this section shall be supplied by the person making the change. The modified equipment shall not be operated under an authorization of the Commission prior to acknowledgement by the Commission that the change is acceptable.

(c) A grantee desiring to make a change other than a permissive change as described in paragraph (b) of this section shall file an application on FCC Form 731 accompanied by the required fees. The grantee shall attach a description of the change(s) to be made and a statement indicating whether the change(s) will be made in all units (including previous production) or will be made only in those units produced after the change(s) is authorized.

(d) If the Commission authorizes the changes requested, it may require the assignment of a new FCC Identifier.

(e) Users shall not modify their own equipment except as provided by paragraphs (b) and (f) of this section.

(f) Equipment type accepted for use in the Amateur Radio Service pursuant to the requirements of part 97 of this chapter may be modified without regard to the conditions specified in paragraph (b) of this section, provided the following conditions are met:

(1) Any person performing such modifications on equipment used under part 97 of this chapter must possess a valid amateur radio operator license of the class required for the use of the equipment being modified.

(2) Modifications made pursuant to this paragraph are limited to equipment used at licensed amateur radio stations.

(3) Modifications specified or performed by equipment manufacturers or suppliers must be in accordance with the requirements set forth in paragraph (b) of this section.

(4) Modifications specified or performed by licensees in the Amateur Radio Service on equipment other than that at specific licensed amateur radio stations must be in accordance with the requirements set forth in paragraph (b) of this section.

(5) The station licensee shall be responsible for insuring that modified equipment used at his station will comply with the applicable technical standards in part 97 of this chapter.

(g) The interconnection of a type accepted AM broadcast stereophonic exciter-generator with a type accepted AM broadcast transmitter in accordance with the manufacturer's instructions and upon completion of measurements showing that the modified transmitter meets the emission limitation requirements of § 73.44 is defined as a Class I permissive change for compliance with this section.

(h) The interconnection of a multiplexing exciter with a type accepted AM broadcast transmitter in accordance with the manufacturer's instructions without electrical or mechanical modification of the transmitter circuits and completion of equipment performance measurements showing the transmitter meets the minimum performance requirements applicable thereto is defined as a Class I permissive change for compliance with this section.

(i) The addition of TV broadcast subcarrier generators to a type accepted TV broadcast transmitter or the addition of FM broadcast subcarrier generators to a type accepted FM broadcast transmitter, provided the transmitter exciter is designed for subcarrier operation without mechanical or electrical alterations to the exciter or other transmitter circuits.

(j) The addition of TV broadcast stereophonic generators to a type accepted TV broadcast transmitter or the addition of FM broadcast stereophonic generators to a type accepted FM broadcast transmitter, provided the transmitter exciter is designed for stereophonic sound operation without mechanical or electrical alterations to the exciter or other transmitter circuits.

(k) The addition of subscription TV encoding equipment for which the FCC has granted advance approval under the provisions of § 2.1400 in subpart M and § 73.644(c) of part 73 to a type accepted transmitter is considered a Class I permissive change described in paragraph (b)(1) of this section.

(l) Notwithstanding the provisions of this section, broadcast licensees or permittees are permitted to modify type

accepted equipment pursuant to § 73.1690 of the FCC's Rules.

[39 FR 5919, Feb. 15, 1974, as amended at 39 FR 27803, Aug. 1, 1974; 41 FR 19948, May 14, 1976; 43 FR 12687, Mar. 27, 1978; 46 FR 18981, Mar. 27, 1981; 48 FR 56391, Dec. 21, 1983; 49 FR 27147, July 2, 1984; 49 FR 34014, Aug. 28, 1984; 51 FR 2707, Jan. 21, 1986; 51 FR 39535, Oct. 29, 1986; 51 FR 41628, Nov. 18, 1986]

§ 2.1003 Information required on identification label for type accepted equipment.

(a) Each equipment for which a type acceptance application is filed on or after May 1, 1981, shall bear an identification plate or label pursuant to §§ 2.925 and 2.926. The FCC Identifier for such equipment will be validated by the grant of type acceptance issued by the Commission.

(b) For each equipment covered by a type acceptance application filed before May 1, 1981, the identification plate or label shall contain the following:

(1) Name of the grantee of the type acceptance.

(2) The words ''FCC TRANSMITTER DATA'' followed by the number assigned to the equipment by the grantee. The abbreviations ''XMTR'' or ''TX'' may be used in place of the word ''TRANSMITTER.''

NOTE: If the equipment is a transceiver containing transmitting and receiving capablity and a single identifier is assigned, the words ''FCC DATA,'' followed by the number assigned to the equipment by the grantee shall be used. If the transmitter part and the receiver part are assigned separate identifiers, the marking of paragraph (2) shall be used for the transmitter part and the marking of § 2.1045(b)(3) shall be used for the receiver part if the receiver part is subject to the requirement for certification.

(3) Any other statement or labelling requirement imposed by the rules governing the operation of this equipment, except that statements of compliance with equipment approval rules or technical standards may be per- mitted to appear in a clear and recognizable manner elsewhere on the equipment.

(Secs. 4, 303, 307, 48 Stat., as amended, 1066, 1082, 1083; sec. 302, 82 Stat. 290 (47 U.S.C. 154, 302, 303, 307))

[44 FR 17179, Mar. 21, 1979; 44 FR 21021, Apr. 9, 1979, as amended at 45 FR 71356, Oct. 28, 1980]

§ 2.1005 Equipment for use in the Amateur Radio Service.

(a) The general provisions of §§ 2.981, 2.983, 2.991, 2.993, 2.997, 2.999, 2.1001, and 2.1003 shall apply to application for and grants of type acceptance for equipment operated under the requirements of part 97 of this chapter, the Amateur Radio Service.

(b) When performing the tests specified in §§ 2.991 and 2.993 of this part, the center of the transmitted bandwidth shall be within the operating frequency band by an amount equal to 50 percent of the bandwidth utilized for the tests. In addition, said tests shall be made on at least one frequency in each of the bands within which the equipment is capable of tuning.

(c) Any supplier of an external radio frequency power amplifier kit as defined by § 97.3(z) of this chapter shall comply with the following requirements:

(1) Assembly of one unit of a specific type shall be made in exact accordance with the instructions being supplied with the product being marketed. If all of the necessary components are not normally furnished with the kit, assembly shall be made using the recommended components.

(2) The measurement data required for type acceptance shall be obtained for this unit and submitted with the type acceptance application. Unless otherwise requested, it is not necessary to submit this unit with the application.

(3) A copy of the exact instructions which will be provided for assembly of the equipment shall be provided in addition to other material required by § 2.983 of this part.

(4) The identification label required by §§ 2.925 and 2.1003 of this part shall be permanently affixed to the assembled unit and shall be of sufficient size so as to be easily read. The following information shall be shown on the label:

(Name of Grantee of Type Acceptance)

FCC ID: (The number assigned to the equipment by the Grantor)

This amplifier can be expected to comply with part 97 of the FCC Regulations when assembled and aligned in strict accordance

with the instruction manual using components supplied with the kit or an exact equivalent thereof.

(Title and signature of responsible representative of Grantee)

STATEMENT OF COMPLIANCE

I state that I have constructed this equipment in accordance with the instruction manual and using the parts furnished by the supplier of this kit.

(Signature) (Date)

(Amateur call sign) (Class of license)

(Expiration date of license)

(To be signed by the person responsible for proper assembly of kit.)

(5) If requested, an unassembled unit shall be provided for assembly and test by the Commission. Shipping charges to and from the Commission's Laboratory shall be borne by the applicant for type acceptance.

(d) Type acceptance of external radio frequency power amplifiers and amplifier kits may be denied when denial serves the public interest, convenience and necessity by preventing the use of these amplifiers in services other than the Amateur Radio Service. Other uses of these amplifiers, such as in the Citizens Band Radio Service, are prohibited (CB Rule 21 of this chapter). Examples of features which may result in the denial of type acceptance are contained in §97.77 of this chapter.

(Sec. 302, 82 Stat. 290; 47 U.S.C. 302; secs. 4, 303, 307, 48 Stat., as amended, 1066, 1082, 1083; 47 U.S.C. 154, 303, 307)

[43 FR 12688, Mar. 27, 1978, as amended at 46 FR 18981, Mar. 27, 1981]

CERTIFICATION

§2.1031 Cross reference.

The general provisions of this subpart §2.901 *et seq.* shall apply to applications for and grants of certification.

§2.1033 Application for certification.

(a) An application for certification shall be filed on FCC Form 731 with all questions answered. Items that do not apply shall be so noted.

(b) The application shall be accompanied by a technical report containing the following information:

(1) The full name and mailing address of the manufacturer of the device and the applicant for certification.

(2) FCC identifier.

(3) A copy of the installation and operating instructions to be furnished the user. A draft copy of the instructions may be submitted if the actual document is not available. The actual document shall be furnished to the FCC when it becomes available.

(4) A brief description of the circuit functions of the device along with a statement describing how the device operates. This statement should contain a description of the ground system and antenna, if any, used with the device.

(5) A block diagram showing the frequency of all oscillators in the device. The signal path and frequency shall be indicated at each block. The tuning range(s) and intermediate frequency(ies) shall be indicated at each block. A schematic diagram also is required for intentional radiators.

(6) A report of measurements of radiated and conducted emissions. This shall identify the test procedure used (e.g., indicate the FCC test procedure used or, if an alternate test procedure was used, a description of the test procedure and the reason it was necessary to use an alternate procedure), the date the measurements were made, the location where the measurements were made, and the device tested (model and serial number, if available). It shall also include a sample calculation showing how the obtained measurements were converted to the levels specified in the applicable rule sections.

(7) A sufficient number of photographs to clearly show the exterior appearance, the construction, the component placement on the chassis, and the chassis assembly. The exterior views shall show the overall appearance, the antenna used with the device (if any), the controls available to the user, and the required identification label in sufficient detail so that the name and FCC identifier can be read. In lieu of a photograph of the label, a sample label (or facsimile thereof) may be submitted together with a sketch showing where

this label will be placed on the equipment. Photographs shall be of size A4 (21 cm × 29.7 cm) or 8 × 10 inches (20.3 cm × 25.4 cm). Smaller photographs may be submitted provided they are sharp and clear, show the necessary detail, and are mounted on A4 (21 cm × 29.7 cm) or 8.5 × 11 inch (21.6 cm × 27.9 cm) paper. A sample label or facsimile together with the sketch showing the placement of this label shall be on the same size paper.

(8) If the equipment for which certification is being sought must be tested with peripheral or accessory devices connected or installed, a brief description of those peripherals or accessories. The peripheral or accessory devices shall be unmodified, commercially available equipment.

(9) For equipment subject to the provisions of part 15 of this chapter, the application shall indicate if the equipment is being authorized pursuant to the transition provisions in § 15.37 of this chapter.

(10) For a device used in decoding the Emergency Broadcast System Attention Signal, as defined in § 73.906 of this chapter, the value of the necessary voltage (RMS) or range of voltages of the attention signal to be applied to the input terminals of the decoder which will cause the desired-response of the device. In the event that input signals other than the attention signal (excluding signals which in combination form the attention signal), including signals outside this voltage range, will cause false responses by the device, a description of such signals and their input voltage levels that cause such false responses shall be specified in the application and appropriate warnings shall be included in the instructions furnished to the user. The susceptibility of the device to false responses and any lack of reliability in responding to the attention signal at input levels within the rated voltage range may be regarded by the Commission as cause to deny certification.

(11) Applications for the certification of direct sequence spread spectrum transmitters under part 15 shall be accompanied by an exhibit demonstrating compliance with the processing gain provisions of § 15.257(e) of this chapter. Applications for the certification of frequency hopping transmitters under part 15 shall be accompanied by an exhibit describing compliance of the associated receiver or receivers with § 15.247(a)(1) of this chapter.

(12) Applications for the certification of scanning receivers shall include a statement describing the methods used to comply with the design requirements of § 15.121(a) of this chapter or the marketing requirements of § 15.121(b) of this chapter.

(c) For a composite system that incorporates only devices subject to certification, verification and/or notification and that are contained in a single enclosure, a separate application, FCC Form 731, shall be submitted with the appropriate fee for each type of device within the enclosure. At the option of the applicant, a single FCC identifier may be requested for that system. Fees are based on the number of devices and types of authorizations.

[39 FR 5919, Feb. 15, 1974, as amended at 39 FR 27803, Aug. 1, 1974; 41 FR 19948, May 14, 1976; 50 FR 36067, Sept. 5, 1985; 54 FR 17713, Apr. 25, 1989; 55 FR 28762, July 13, 1990; 58 FR 25575, Apr. 27, 1993; 58 FR 44893, Aug. 25, 1993]

§ 2.1035 [Reserved]

§ 2.1041 Measurement procedure.

The measurement procedures are specified in the rules governing the particular device for which certification is requested.

§ 2.1043 Changes in certificated equipment.

(a) Changes to the basic frequency determining and stabilizing circuitry (including clock or data rates), frequency multiplication stages, basic modulator circuit or maximum power or field strength ratings shall not be performed without application for and authorization of a new grant of certification. Variations in electrical or mechanical construction, other than these indicated items, are permitted provided the variations either do not affect the characteristics required to be reported to the Commission or the variations are made in compliance with the other provisions of this section.

(b) Two classes of permissive changes may be made in certificated equipment

without requiring a new application for and grant of certification. Neither class of change shall result in a change in identification.

(1) A Class I permissive change includes those modifications in the equipment which do not degrade the characteristics reported by the manufacturer and accepted by the Commission when certification is granted. No filing with the Commission is required for a Class I permissive change.

(2) A Class II permissive change includes those modifications which degrade the performance characteristics as reported to the Commission at the time of the initial certification. Such degraded performance must still meet the minimum requirements of the applicable rules. When a Class II permissive change is made by the grantee, he shall supply the Commission with complete information and the results of tests of the characteristics affected by such change. The modified equipment shall not be marketed under the existing grant of certification prior to acknowledgement by the Commission that the change is acceptable.

(3) Permissive changes, as detailed above, shall be made only by the holder of the grant of certification. Changes by any party other than the grantee require a new application for and grant of certification.

(c) A grantee desiring to make a change other than a permissive change shall file an application on FCC Form 731 accompanied by the required fees. The grantee shall attach a description of the change(s) to be made and a statement indicating whether the change(s) will be made in all units (including previous production) or will be made only in those units produced after the change is authorized.

(d) A modification which results in a change in the identification with or without change in circuitry requires a new application for, and grant of certification. If the changes affect the characteristics required to be reported, a complete application shall be filed. If the characteristics required to be reported are not changed the abbreviated procedure of §2.933 may be used.

[39 FR 27803, Aug. 1, 1974, as amended at 41 FR 19948, May 14, 1976; 54 FR 1699, Jan. 17, 1989; 54 FR 17714, Apr. 25, 1989; 54 FR 32339, Aug. 7, 1989]

§2.1045 Information required on identification label for certificated equipment.

(a) Each equipment for which a certification application is filed on or after May 1, 1981, shall be identified pursuant to §§2.925 and 2.926. The FCC Identifier for such equipment will be validated by the grant of certification issued by the Commission.

(b) For each equipment covered by a certification application filed before May 1, 1981, the identification label shall contain at least the following:

(1) The trade name. The trade name, if shown elsewhere on the equipment, shall be the same as that shown on the label.

(2) For consumer equipment (i.e., broadcast receivers, part 15 walkie-talkies, and other equipment sold to the general public), the words ''MODEL NO.'' followed by the number assigned to the equipment by the grantee. If the identification label contains other numbers in addition to that required by this paragraph, such as ''SERVICE NO.,'' ''CATALOG NO.'' or other similar terms, to avoid confusion with the identifier required by the Commission, the words ''MODEL NO.'' may be preceded by the term ''FCC DATA'' to facilitate recognition of the identifying number used for FCC.

(3) For communications equipment (i.e., receivers and other equipment normally used at licensed stations) the words ''FCC RECEIVER DATA'' followed by the number assigned to the equipment by the grantee. The abbreviations ''RCVR'' or ''RX'' may be used in lieu of the word ''RECEIVER.''

NOTE: If the equipment is a transceiver having transmitting and receiving capability and a single identifier is assigned the marking of §2.1003(b)(2) shall be used. If the transmitter part and the receiver part are assigned separate identifiers, the marking of §2.1003(b)(2) shall be used for the transmitter

part and the marking of §2.1003(b) (2) or (3) shall be used for the receiver part.

(4) Any other statement or labelling requirement imposed by the rules governing operation of this equipment, except that statements of compliance with equipment approval rules or technical standards may appear in a clear and recognizable manner elsewhere on the equipment.

(Secs. 4, 303, 307, 48 Stat., as amended, 1066, 1082, 1083; sec. 302, 82 Stat., 290 (47 U.S.C. 154, 302, 303, 307))

[44 FR 17180, Mar. 21, 1979, as amended at 45 FR 71356, Oct. 28, 1980]

FILING FOR APPLICATION REFERENCE

§ 2.1061 Submission of technical information for application reference.

An application for station authorization in some services requires a detailed technical description of the equipment proposed to be used. In order to simplify the preparation and processing of applications by eliminating the need for the submission of equipment specifications with each application, the Commission will accept for application reference purposes detailed technical specifications of equipment designed for use in these services. Manufacturers desiring to avail themselves of this procedure should submit all information required by the application form and the rules for the services in which the equipment is to be used. An application for a station authorization submitted subsequent to such filing may refer to the technical information so filed.

§ 2.1063 Disclaimer re technical information filed for application reference.

Receipt by the Commission of data for application purposes does not imply that the Commission has made or intends to make any finding regarding the acceptability of the equipment for licensing and such equipment will not be included on the list of equipment acceptable for licensing. Each applicant is expected to exercise appropriate care in the selection of equipment to insure that the unit selected will comply with the rules governing the service in which it is proposed to operate.

§ 2.1065 Identification and changes in equipment information filed for application reference.

(a) Each type of equipment, for which information is filed for application reference purposes, shall be identified by a type number assigned by the manufacturer of the equipment. The type number shall consist of a series of Arabic numerals or capital letters or a combination thereof, and may include punctuation marks and spaces. The total of Arabic numerals, capital letters, punctuation marks and spaces in any assigned type number shall not exceed 17. The type number shall be shown on an identification plate or label affixed in a conspicuous place to such equipment.

(b) If the assignment of a different type number is required as a result of equipment modification, a new identification plate or label bearing the new type number shall be affixed to the modified equipment.

NOTE: It is recommended that such equipment be identified with a nameplate pursuant to §2.925, except for deletion of the FCC Identifier, which will not be assigned to nor listed for such equipment.

(Secs. 4, 303, 48 Stat., as amended, 1066, 1082, sec. 302, 82 Stat., 290 (47 U.S.C. 154, 302, 303))

[39 FR 28160, Aug. 5, 1974, as amended at 44 FR 17180, Mar. 21, 1979]

DECLARATION OF CONFORMITY

§ 2.1071 Cross reference.

The general provisions of this subpart, shall apply to equipment subject to a Declaration of Conformity.

[61 FR 31046, June 19, 1996]

§ 2.1072 Limitation on Declaration of Conformity.

(a) The Declaration of Conformity signifies that the responsible party, as defined in §2.909, has determined that the equipment has been shown to comply with the applicable technical standards if no unauthorized change is made in the equipment and if the equipment is properly maintained and operated. Compliance with these standards shall not be construed to be a finding by the responsible party with respect to matters not encompassed by the Commission's rules.

(b) A Declaration of Conformity by the responsible party is effective until a termination date is otherwise established by the Commission.

(c) No person shall, in any advertising matter, brochure, etc., use or make reference to a Declaration of Conformity in a deceptive or misleading manner or convey the impression that such a Declaration of Conformity reflects more than a determination by the responsible party that the device or product has been shown to be capable of complying with the applicable technical standards of the Commission's rules.

[61 FR 31046, June 19, 1996]

§2.1073 Responsibilities.

(a) The responsible party, as defined in §2.909, must warrant that each unit of equipment marketed under a Declaration of Conformity is identical to the unit tested and found acceptable with the standards and that the records maintained by the responsible party continue to reflect the equipment being produced under the Declaration of Conformity within the variation that can be expected due to quantity production and testing on a statistical basis.

(b) The responsible party, if different from the manufacturer, may upon receiving a written statement from the manufacturer that the equipment complies with the appropriate technical standards rely on the manufacturer or independent testing agency to determine compliance. However, the test records required by §2.1075 shall be in the English language and shall be made available to the Commission upon a reasonable request in accordance with the provisions of §2.1076.

(c) In the case of transfer of control of the equipment, as in the case of sale or merger of the responsible party, the new responsible party shall bear the responsibility of continued compliance of the equipment.

(d) Equipment shall be retested to demonstrate continued compliance with the applicable technical standards if any modifications or changes that could adversely affect the emanation characteristics of the equipment are made by the responsible party. The responsible party bears responsibility for the continued compliance of subsequently produced equipment.

(e) If any modifications or changes are made by anyone other than the responsible party for the Declaration of Conformity, the party making the modifications or changes, if located within the U.S., becomes the new responsible party. The new responsible party must comply with all provisions for the Declaration of Conformity, including having test data on file demonstrating that the product continues to comply with all of the applicable technical standards.

[61 FR 31046, June 19, 1996]

§2.1074 Identification.

Devices subject only to a Declaration of Conformity shall be uniquely identified by the responsible party. This identification shall not be of a format which could be confused with the FCC Identifier required on certified, notified, type accepted or type approved equipment. The responsible party shall maintain adequate identification records to facilitate positive identification for each device.

[61 FR 31047, June 19, 1996]

§2.1075 Retention of records.

(a) Except as shown in paragraph (b) of this section, for each product subject to a Declaration of Conformity, the responsible party, as shown in §2.909, shall maintain the following records:

(1) A record of the original design drawings and specifications and all changes that have been made that may affect compliance with the requirements of §2.1073.

(2) A record of the procedures used for production inspection and testing (if tests were performed) to insure the conformance required by §2.1073. (Statistical production line emission testing is not required.)

(3) A record of the measurements made on an appropriate test site that demonstrates compliance with the applicable regulations. The record shall contain:

(i) The actual date or dates testing was performed;

(ii) The name of the test laboratory, company, or individual performing the testing. The Commission may request

additional information regarding the test site, the test equipment or the qualifications of the company or individual performing the tests;

(iii) A description of how the device was actually tested, identifying the measurement procedure and test equipment that was used;

(iv) A description of the equipment under test (EUT) and support equipment connected to, or installed within, the EUT;

(v) The identification of the EUT and support equipment by trade name and model number and, if appropriate, by FCC Identifier and serial number;

(vi) The types and lengths of connecting cables used and how they were arranged or moved during testing;

(vii) At least two photographs showing the test set-up for the highest line conducted emission and showing the test set-up for the highest radiated emission. These photographs must be focused originals which show enough detail to confirm other information contained in the test report;

(viii) A description of any modifications made to the EUT by the testing company or individual to achieve compliance with the regulations;

(ix) All of the data required to show compliance with the appropriate regulations;

(x) The signature of the individual responsible for testing the product along with the name and signature of an official of the responsible party, as designated in § 2.909; and

(xi) A copy of the compliance information, as described in § 2.1077, required to be provided with the equipment.

(b) If the equipment is assembled using modular components that, by themselves, are subject to authorization under a Declaration of Conformity and/or a grant of certification, and the assembled product is also subject to authorization under a Declaration of Conformity but, in accordance with the applicable regulations, does not require additional testing, the assembler shall maintain the following records in order to show the basis on which compliance with the standards was determined:

(1) A listing of all of the components used in the assembly;

(2) Copies of the compliance information, as described in § 2.1077 for all of the modular components used in the assembly;

(3) A listing of the FCC Identifier numbers for all of the components used in the assembly that are authorized under a grant of certification;

(4) A listing of equipment modifications, if any, that were made during assembly; and

(5) A copy of any instructions included with the components that were required to be followed to ensure the assembly of a compliant product, along with a statement, signed by the assembler, that these instructions were followed during assembly. This statement shall also contain the name and signature of an official of the responsible party, as designated in § 2.909.

(c) The records listed in paragraphs (a) and (b) of this section shall be retained for two years after the manufacture or assembly, as appropriate, of said equipment has been permanently discontinued, or until the conclusion of an investigation or a proceeding if the responsible party is officially notified that an investigation or any other administrative proceeding involving the equipment has been instituted. Requests for the records described in this section and for sample units also are covered under the provisions of § 2.946.

[61 FR 31047, June 19, 1996]

§ 2.1076 FCC inspection and submission of equipment for testing.

(a) Each responsible party, upon receipt of a reasonable request, shall submit to the Commission the records required by § 2.1075 or one or more sample units for measurements at the Commission's laboratory.

(b) Shipping costs to the Commission's Laboratory and return shall be borne by the responsible party. In the event the responsible party believes that shipment of the sample to the Commission's Laboratory is impractical because of the size or weight of the equipment, or the power requirement, or for any other reason, the responsible party may submit a written explanation why such shipment is impractical and should not be required.

[61 FR 31047, June 19, 1996]

§2.1077 Compliance information.

(a) If a product must be tested and authorized under a Declaration of Conformity, a compliance information statement shall be supplied with the product at the time of marketing or importation, containing the following information:

(1) Identification of the product, *e.g.*, name and model number;

(2) A statement, similar to that contained in §15.19(a)(3) of this chapter, that the product complies with part 15 of this chapters; and

(3) The identification, by name, address and telephone number, of the responsible party, as defined in §2.909. The responsible party for a Declaration of Conformity must be located within the United States.

(b) If a product is assembled from modular components that, by themselves, are authorized under a Declaration of Conformity and/or a grant of certification, and the assembled product is also subject to authorization under a Declaration of Conformity but, in accordance with the applicable regulations, does not require additional testing, the product shall be supplied, at the time of marketing or importation, with a compliance information statement containing the following information:

(1) Identification of the modular components used in the assembly. A modular component authorized under a Declaration of Conformity shall be identified as specified in paragraph (a)(1) of this section. A modular component authorized under a grant of certification shall be identified by name and model number (if applicable) along with the FCC Identifier number.

(2) A statement that the product complies with part 15 of this chapter.

(3) The identification, by name, address and telephone number, of the responsible party who assembled the product from modular components, as defined in §2.909. The responsible party for a Declaration of Conformity must be located within the United States.

(4) Copies of the compliance information statements for each modular component used in the system that is authorized under a Declaration of Conformity.

(c) The compliance information statement shall be included in the user's manual or as a separate sheet.

[61 FR 31048, June 19, 1996]

RADIOFREQUENCY RADIATION EXPOSURE

§2.1091 Radiofrequency radiation exposure evaluation: mobile and unlicensed devices.

(a) Requirements of this section are a consequence of Commission responsibilities under the National Environmental Policy Act to evaluate the environmental significance of its actions. See subpart I of part 1 of this chapter, in particular §1.1307(b).

(b) For purposes of this section mobile devices are defined as transmitters designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 centimeters is normally maintained between radiating antennas and the body of the user or nearby persons.

(c) Mobile devices that operate in the Cellular Radiotelephone Service, the Personal Communications Services, the Satellite Communications Services, the Maritime Services and the Specialized Mobile Radio Service authorized under subpart H of part 22, part 24, part 25, part 80 of this chapter (ship earth station devices only) and part 90 of this chapter (''covered'' SMR devices only, as defined in the note to table 1 of §1.1307(b)(1) of this chapter), are subject to routine environmental evaluation for RF exposure prior to equipment authorization or use if their effective radiated power (ERP) is 1.5 watts or more. Unlicensed personal communications service and unlicensed millimeter wave devices authorized under §15.253, §15.255 and subpart D of part 15 of this chapter are also subject to routine environmental evaluation for RF exposure prior to equipment authorization or use, regardless of their power used, unless they meet the definition of a portable device as specified in §2.1093(b). All other mobile and unlicensed transmitting devices are categorically excluded from routine environmental evaluation for RF exposure prior to equipment authorization, except as specified in §§1.1307(c) and 1.1307(d) of this chapter. Applications

for equipment authorization of mobile and unlicensed transmitting devices subject to routine environmental evaluation must contain a statement confirming compliance with the limits specified in paragraph (d) of this section as part of their application. Technical information showing the basis for this statement must be submitted to the Commission upon request.

(d) The limits to be used for evaluation are specified in § 1.1310 of this chapter. All unlicensed personal communications service (PCS) devices shall be subject to the limits for general population/uncontrolled exposure.

(1) For purposes of analyzing mobile transmitting devices under the occupational/controlled criteria specified in § 1.1310 of this chapter, time-averaging provisions of the guidelines may be used in conjunction with typical maximum duty factors to determine maximum likely exposure levels.

(2) Time-averaging provisions may not be used in determining typical exposure levels for devices intended for use by consumers in general population/uncontrolled environments as defined in § 1.1310 of this chapter. However, ''source-based'' time-averaging based on an inherent property or duty-cycle of a device is allowed. An example of this is the determination of exposure from a device that uses digital technology such as a time-division multiple-access (TDMA) scheme for transmission of a signal. In general, maximum average power levels must be used to determine compliance.

(3) Compliance with exposure guidelines for mobile and unlicensed devices can be accomplished by the use of warning labels and by providing users with information concerning minimum separation distances from transmitting structures and proper installation of antennas.

[61 FR 41017, Aug. 7, 1996]

§ 2.1093 Radiofrequency radiation exposure evaluation: portable devices.

(a) Requirements of this section are a consequence of Commission responsibilities under the National Environmental Policy Act to evaluate the environmental significance of its actions. See subpart I of Part 1 of this chapter, in particular § 1.1307(b).

(b) For purposes of this section portable devices are defined as transmitters designed to be used within 20 centimeters of the body of the user.

(c) Portable devices that operate in the Cellular Radiotelephone Service, the Personal Communications Services, the Satellite Communications services, the Maritime Services and the Specialized Mobile Radio Service authorized under subpart H of part 22 of this chapter, part 24 of this chapter, part 25 of this chapter, part 80 of this chapter (ship earth station devices only), part 90 of this chapter (''covered'' SMR devices only, as defined in the note to table 1 of § 1.1307(b)(1) of this chapter), and portable unlicensed personal communication service and millimeter wave devices authorized under § 15.253, § 15.255 or subpart D of part 15 of this chapter are subject to routine environmental evaluation for RF exposure prior to equipment authorization or use. All other portable transmitting devices are categorically excluded from routine environmental evaluation for RF exposure prior to equipment authorization, except as specified in §§ 1.1307(c) and 1.1307(d) of this chapter. Applications for equipment authorization of portable transmitting devices subject to routine environmental evaluation must contain a statement confirming compliance with the limits specified in paragraph (d) of this section as part of their application. Technical information showing the basis for this statement must be submitted to the Commission upon request.

(d) The limits to be used for evaluation are based generally on criteria published by the American National Standards Institute (ANSI) for localized specific absorption rate (''SAR'') in Section 4.2 of ''IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz,'' ANSI/IEEE C95.1–1992, Copyright 1992 by the Institute of Electrical and Electronics Engineers, Inc., New York, New York 10017. These criteria for SAR evaluation are similar to those recommended by the National Council on Radiation Protection and Measurements (NCRP) in ''Biological Effects

and Exposure Criteria for Radiofrequency Electromagnetic Fields,'' NCRP Report No. 86, Section 17.4.5. Copyright NCRP, 1986, Bethesda, Maryland 20814. SAR is a measure of the rate of energy absorption due to exposure to an RF transmitting source. SAR values have been related to threshold levels for potential biological hazards. The criteria to be used are specified in paragraphs (d)(1) and (d)(2) of this section.

(1) Limits for Occupational/Controlled exposure: 0.4 W/kg as averaged over the whole-body and spatial peak SAR not exceeding 8 W/kg as averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube). Exceptions are the hands, wrists, feet and ankles where the spatial peak SAR shall not exceed 20 W/kg, as averaged over an 10 grams of tissue (defined as a tissue volume in the shape of a cube). Occupational/Controlled limits apply when persons are exposed as a consequence of their employment provided these persons are fully aware of and exercise control over their exposure. Awareness of exposure can be accomplished by use of warning labels or by specific training or education through appropriate means, such as an RF safety program in a work environment.

(2) Limits for General Population/Uncontrolled exposure: 0.08 W/kg as averaged over the whole-body and spatial peak SAR not exceeding 1.6 W/kg as averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube). Exceptions are the hands, wrists, feet and ankles where the spatial peak SAR shall not exceed 4 W/kg, as averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube). General Population/Uncontrolled limits apply when the general public may be exposed, or when persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or do not exercise control over their exposure. Warning labels placed on consumer devices such as cellular telephones will not be sufficient reason to allow these devices to be evaluated subject to limits for occupational/controlled exposure in paragraph (d)(1) of this section.

(3) Compliance with SAR limits can be demonstrated by either laboratory measurement techniques or by computational modeling. Methodologies and references for SAR evaluation are described in numerous technical publications including ''IEEE Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields—RF and Microwave,'' IEEE C95.3–1991.

(4) For purposes of analyzing portable transmitting devices under the occupational/controlled criteria, the time-averaging provisions of the MPE guidelines identified in §1.1310 of this chapter can be used in conjunction with typical maximum duty factors to determine maximum likely exposure levels.

(5) Time-averaging provisions of the MPE guidelines identified in §1.1310 of this chapter may not be used in determining typical exposure levels for portable devices intended for use by consumers, such as hand-held cellular telephones, that are considered to operate in general population/uncontrolled environments as defined above. However, ''source-based'' time-averaging based on an inherent property or duty-cycle of a device is allowed. An example of this would be the determination of exposure from a device that uses digital technology such as a time-division multiple-access (TDMA) scheme for transmission of a signal. In general, maximum average power levels must be used to determine compliance.

[61 FR 41017, Aug. 7, 1996]

Subpart K—Importation of Devices Capable of Causing Harmful Interference

§2.1201 Purpose.

(a) In order to carry out its responsibilities under the Communications Act and the various treaties and international regulations, and in order to promote efficient use of the radio spectrum, the Commission has developed technical standards for radio frequency equipment. The technical standards applicable to individual types of equipment are found in that part of the rules governing the service wherein the

equipment is to be operated. In addition to the technical standards, the rules governing the service may require that such equipment receive an equipment authorization from the Commission as a prerequisite for marketing and importing this equipment into the U.S.A. The marketing rules, § 2.801 *et seq.*, were adopted pursuant to the authority in section 302 of the Communications Act of 1934, as amended (47 U.S.C. 302).

(b) The rules in this section set out the conditions under which radio frequency devices as defined in § 2.801 that are capable of causing harmful interference to radio communications may be imported into the U.S.A.

(c) Nothing in this section prevents importers from shipping goods into foreign trade zones or Customs bonded warehouses, such as is the prescribed procedure under § 2.1204(a)(5). Radio frequency devices capable of causing harmful interference, however, cannot be withdrawn from these areas except in accordance with the provisions of this section.

[41 FR 25904, June 23, 1976, as amended at 54 FR 17714, Apr. 25, 1989; 56 FR 26619, June 10, 1991; 57 FR 38286, Aug. 24, 1992]

§ 2.1202 Exclusions.

The provisions of this section do not apply to the importation of:

(a) Cameras, musical greeting cards, quartz watches and clocks, modules of quartz watches and clocks, hand-held calculators and electronic games, and other similar unintentional radiators which utilize low level battery power and which do not contain provisions for operation while connected to AC power lines.

(b) Unintentional radiators which are exempted from technical standards and other requirements as specified in § 15.103 of this chapter.

(c) Radio frequency devices manufactured and assembled in the U.S.A. that meet applicable FCC technical standards and which have not been modified or received further assembly.

(d) Radio frequency devices previously properly imported that have been exported for repair and re-imported for use.

(e) Subassemblies, parts, or components of radio frequency devices unless they constitute an essentially completed device which requires only the addition of cabinets, knobs, speakers, or similar minor attachments before marketing or use. Form 740 information will be required to be submitted for computer circuit boards that are actually peripheral devices as defined in § 15.3(r) of this chapter and all devices that, by themselves, are subject to FCC marketing rules.

[56 FR 26619, June 10, 1991]

§ 2.1203 General requirement for entry into the U.S.A.

(a) No radio frequency device may be imported into the Customs territory of the United States unless the importer or ultimate consignee, or their designated customs broker, declares that the device meets one of the conditions for entry set out in this section.

(b) A separate declaration shall be used for each line item in the entry or entry summary containing an RF device, or for each different radio frequency device within a line item when the elements of the declaration are not identical.

(c) Failure to properly declare the importation category for an entry of radio frequency devices may result in refused entry, refused withdrawal for consumption, required redelivery to the Customs port, and other administrative, civil and criminal remedies provided by law.

(d) Whoever makes a declaration pursuant to § 2.1203(a) must provide, upon request made within one year of the date of entry, documentation on how an imported radio frequency device was determined to be in compliance with Commission requirements.

[56 FR 26619, June 10, 1991; 56 FR 32474, July 16, 1991]

§ 2.1204 Import conditions.

(a) Radio frequency devices may be imported only if one or more of these conditions are met:

(1) The radio frequency device has been issued an equipment authorization by the FCC.

(2) The radio frequency device is not required to have an equipment authorization and the device complies with

FCC technical administrative regulations.

(3) The radio frequency device is being imported in limited quantities for testing and evaluation to determine compliance with the FCC Rules and Regulations or suitability for marketing. The device will not be offered for sale or marketed. The phrase ''limited quantities,'' in this context, means 200 or fewer units. Prior to importation of more than 200 units, written approval must be obtained from the Chief, Enforcement Division, Field Operations Bureau, FCC. Distinctly different models of a product and separate generations of a particular model under development are considered to be separate devices.

(4) The radio frequency device is being imported in limited quantities for demonstration at industry trade shows and the device will not be offered for sale or marketed. The phrase ''limited quantities,'' in this context, means ten or fewer units. Prior to importation of more than ten units, written approval must be obtained from the Chief, Compliance Division, Compliance and Information Bureau, FCC. Distinctly different models of a product and separate generations of a particular model under development are considered to be separate devices.

(5) The radio frequency device is being imported solely for export. The device will not be marketed or offered for sale for use in the U.S.

(6) The radio frequency device is being imported for use exclusively by the U.S. Government.

(7) Three or fewer radio receivers, computers, or other unintentional radiators as defined in part 15 of this chapter, are being imported for the individual's personal use and are not intended for sale.

(8) The radio frequency device is being imported for repair and will not be offered for sale or marketed.

(b) The ultimate consignee must be able to document compliance with the selected import condition and the basis for determining the import condition applied.

[56 FR 26619, June 10, 1991, as amended at 57 FR 38286, Aug. 24, 1992; 61 FR 8477, Mar. 5, 1996]

§2.1205 Filing of required declaration.

NOTE: The U.S. Customs Service is implementing a paperless entry system. Until the Customs electronic system is operational, submit the required declaration following the guidelines in paragraph (a) of this section. When the Customs system is implemented, follow the guidelines in paragraph (b) of this section.

(a) For points of entry where electronic filing with Customs has not been implemented, use FCC Form 740 to provide the needed information and declarations.

(1) Mail the original of FCC Form 740 to: FCC, Washington, DC 20554, Attention: Imports, on or before the date the Customs entry papers are filed.

(2) Attach a copy of FCC Form 740 to the Customs entry papers.

(b)(1) For points of entry where electronic filing with Customs is available, submit the following information to Customs when filing the entry documentation and the entry summary documentation electronically. Follow procedures established by Customs for electronic filing.

(i) The terms under which the device is being imported, as indicated by citing the import condition number specified in §2.1204(a).

(ii) The FCC identifier as specified in §2.925, if the device has been granted an equipment authorization;

(iii) The quantity of devices being imported, regardless of what unit is specified in the Harmonized Tariff Schedule of the United States; and

(iv) A commercial product description which is to include the trade name, a model/type number (or model/type name) and other descriptive information about the device being imported.

(2) For importers unable to participate in the electronic filing process with Customs for good cause, declarations are to be made in accordance with paragraph (a) of this section.

[56 FR 26619, June 10, 1991]

§2.1207 Examination of imported equipment.

In order to determine compliance with its regulations, Commission representatives may examine or test any radio frequency device that is imported. If such radio frequency device

has already entered the U.S., the ultimate consignee or subsequent owners of that device must, upon request, made within one year of the date of entry, make that device available for examination or testing by the Commission.

[56 FR 26620, June 10, 1991]

Subpart L—Registration of Telephone Terminal Equipment

REGISTRATION PROCEDURE

§ 2.1300 Cross reference.

The general provisions of this part, §§ 2.909, 2.923, 2.929, 2.935, 2.936, and 2.946 shall apply to applications for and grants of registration for telephone terminal equipment pursuant to part 68 of this chapter.

(Secs. 201–205, 208, 215, 218, 313, 314, 403, 410, 602, 48 Stat., as amended 1070–1072, 1073, 1076, 1077, 1087, 1094, 1099, 1102 47; U.S.C. 201–205, 208, 215, 218, 313, 314, 403, 410, 602)

[54 FR 1699, Jan. 17, 1989]

§ 2.1302 Application for registration under part 68.

An original application for registration and one copy shall be filed on FCC Form 730 by the party who will be responsible for the conformance of the equipment with the standards specified in part 68 of this chapter and shall include the information specified by the form and in § 68.200 of this chapter.

(Secs. 201–205, 208, 215, 218, 313, 314, 403, 410, 602, 48 Stat., as amended 1070–1072, 1073, 1076, 1077, 1087, 1094, 1099, 1102; 47 U.S.C. 201–205, 208, 215, 218, 313, 314, 403, 410, 602)

[41 FR 8048, Feb. 24, 1976, as amended at 61 FR 42386, Aug. 15, 1996]

EFFECTIVE DATE NOTE: At 61 FR 42386, Aug. 15, 1996, § 2.1302 was amended by removing the words ''two copies'' and adding in their place the words ''one copy'', effective Nov. 13, 1996.

Subpart M—Advance Approval of Subscription TV Transmission Systems

ADVANCE APPROVAL PROCEDURE

§ 2.1400 Application for advance approval under part 73.

(a) An original application for advance approval of a subscription TV (STV) system and one copy thereof must be filed by the party who will be responsible for the conformance of the system with the subscription TV standards specified in part 73 of the Rules. The application must include information to show that the system conforms to the requirements of § 73.644(b).

(b) Advance approval may be applied for and granted in accordance with and subject to the following conditions and limitations:

(1) A separate request for each different technical system must be made by the applicant in writing.

(2) The applicant must certify that the application was prepared by or under the direction of the applicant and that the facts set forth are true and correct to the best of the applicant's knowledge and belief.

(3) The applicant must identify the technical system by a name or type number and define the system in terms of its technical characteristics; a functional block diagram must be included. In addition, a complete description of the encoded aural and visual baseband and transmitted signals and of the encoding equipment used by the applicant must be supplied. These descriptions must include equipment circuit diagrams and photographs, and diagrams or oscillographs of both baseband and transmitted aural and visual signal waveforms and of the signal basebands and occupied bandwidths. If aural subcarriers are to be used for transmitting aural portion of the subscription program, for decoder control, or for other purposes, a full description and specifications of the multiplex subcarrier signals and all modulation levels must be included.

(4) Preliminary test data must be submitted to show system capability with regard to compliance with the criteria set forth in § 73.644(b).

(5) The applicant must identify the specific requirements of §§ 73.682, 73.687 and 73.699 (Figures 6 and 7) from which the transmitted signal will normally deviate.

(6) The applicant must specify the method to be used in determining and maintaining the operating power of the transmitter if the procedures given in § 73.663 cannot be used due to suppression of the synchronizing pulses or for

other reasons. If the operating power of the station must be reduced to accommodate the encoded aural or video signal, the operating power limitations must be specified.

(7) The applicant must supply any additional information and test data requested by the FCC, to show to its satisfaction that the criteria given in §73.644(b) are met.

(8) The information submitted by the applicant may be subject to check by field tests conducted without expense to the FCC or, if deemed necessary, at the laboratory or in the field by FCC personnel. This may include the actual submission of equipment for system testing under the provisions of §2.945 of part 2 of the Rules.

(9) No technical system will be deemed approved unless and until the FCC has notified the applicant in writing of the approval. Such notification of approval will be by letter to the applicant.

(10) Approval by the FCC is limited to a determination that the particular technical system (the scheme for encoding and decoding the subscription TV signal) is capable of meeting the criteria given in §73.644(b).

(11) The FCC will maintain a listing of approved technical systems.

(c) Multichannel sound may be transmitted for stereophonic or bilingual service with encoded subscription programs provided the technical operating specifications for this service are included in the application for advance system approval.

(d) Subscriber decoder devices must comply with any applicable provisions of subpart H, part 15 of the FCC Rules for TV interface devices.

(e) No modifications may be made by either the applicant or the user of a system having advance FCC approval that would change any of the operating conditions as submitted in the application for advance approval. Should system modifications be necessary, a new application must be submitted in accordance with the requirements of this section.

[48 FR 56391, Dec. 21, 1983]

Subpart N—FCC Procedure for Testing Class A, B and S Emergency Position Indicating Radiobeacons (EPIRBs)

SOURCE: 56 FR 11683, Mar. 20, 1991, unless otherwise noted.

GENERAL

§2.1501 Introduction.

The procedure described herein sets forth uniform methods for testing Class A, B and S Emergency Position Indicating Radiobeacons (EPIRBs) for compliance with the applicable portions of the FCC Rules and Regulations. Other methods and test results may be used provided they are fully documented and deemed by the Commission to yield results equivalent to the procedures set forth in this section.

§2.1503 Test environment.

(a) *Measurement sites.* Radiated emission tests for peak effective radiated power (PERP), spurious emissions and power in the test mode are to be performed on an open field test site as shown in Figure 1. The site is to be located on level ground with an obstruction-free, 60 m by 52 m, elliptical area. The site is to be equipped with an antenna mast capable of adjustment from 1 to 4 m. The center of a metal ground plane at least one wavelength in diameter at 121.5 MHz (2.47 m) is to be located 30 m from the receiving antenna. The ground plane is to have provisions for mounting removable quarter-wave verticle elements to produce a monopole antenna at both 121.5 and 243 MHz with the VSWR of less than 1.5.

NOTE: It is desirable that the level of radiated ambient EME at the test site be at least 6 dB below the FCC limits applicable to the EPIRB. It is, of course, not always possible to meet this condition. If the ambient field strength at some frequencies within the specified measurement ranges is too high, it is recommended that one or more of the following corrective steps be employed:

(1) Perform measurements in critical frequency bands during hours when broadcast and other radio stations are off-the-air and ambients from industrial equipment are lower.

(2) Insofar as is possible, orient the axis of an open area test site to discriminate against strong ambient signals.

(3) Vary the bandwidth of the measuring instrument to separate ambient EME from emissions from the EPIRB.

(b) *Temperature.* Except as otherwise noted, the ambient temperature during testing is to be within the range of 4 to 35 °C (40 to 95 °F).

§ 2.1505 Test instrumentation and equipment.

(a) *Receiver (field intensity meter).* A calibrated field intensity meter (FIM) with a frequency range of 30 to 1000 MHz is required for measuring radiated emission levels. This instrument should be capable of making peak measurements with a bandwidth of 100 kHz.

(b) *Spectrum analyzer.* Spectral measurements are to be made with a spectrum analyzer with a minimum resolution bandwidth no greater than 10 Hz. The video filter, if used, should have a bandwidth wide enough so as to not affect peak readings. A linear video output is desirable for performing measurements of modulation characteristics.

(c) *Storage oscilloscope.* Measurements of modulation characteristics are to be made using a calibrated storage oscilloscope. This instrument is to be DC coupled and capable of manually triggered single sweeps.

(d) *Frequency counter.* A frequency counter with an accuracy of at least 5 parts per million is required for measuring the carrier frequency.

(e) *Signal generator.* A calibrated signal generator with an output of at least 75 mW at 121.5 and 243 MHz is required for generating a reference signal for site calibration.

(f) *Antenna.* Radiated emissions are to be measured with calibrated, tuned, half-wave dipole antennas covering the frequency range of 30 to 1000 MHz.

(g) *Temperature chamber.* Tests which call for subjecting the EPIRB to temperature levels other than the ambient temperature are to be performed in a temperature test chamber which can be adjusted to stable temperatures from −20 to +55 °C. This chamber is to be of sufficient size to accommodate the EPIRB under test.

(h) *Vibration table.* A vibration table capable of vibrating the EPIRB with a sinusoidal motion is required. The table must be capable of varying the frequency of vibration either linearly or logarithmically over a range of 4 to 33 Hz with maximum peak amplitudes of up to 2.5 mm.

(i) *Salt fog chamber.* A chamber capable of producing salt fog at a temperature of 35 °C for 48 hours is required. This chamber is to be of sufficient size to accommodate the EPIRB under test.

(j) *Drop test facility.* A facility which will permit dropping an EPIRB from a height of 20 m into water is required. The water must be deep enough so that the EPIRB will not touch bottom when dropped.

ENVIRONMENTAL AND OPERATIONAL TEST PROCEDURES

§ 2.1507 Test frequencies.

Testing of an EPIRB for compliance outside a shielded room on a distress frequency is prohibited, since this may interfere with emergency communications. Therefore, all compliance testing outside a shielded room should be conducted on one of the pairs of alternate frequencies specified below:

121.600/243.200 MHz
121.650/243.300 MHz
121.700/243.400 MHz
121.750/243.500 MHz
121.800/243.600 MHz
121.850/243.700 MHz
121.900/243.800 MHz

The above frequencies are to be used for limited testing of EPIRBs for compliance with FCC Rules, subject to the following conditions:

(a) The testing shall not cause harmful interference to authorized communications on these frequencies.

(b) The testing shall be coordinated with the nearest FCC district office.

For simplicity, 121.5 MHz and 243 MHz will be used throughout this test procedure to indicate the alternate test frequency.

§ 2.1509 Environmental and duration tests.

The environmental and operational tests in § 2.1509 (a) through (e) are to be conducted on a single test unit in the order given below. This sequence of tests also includes the electrical tests in §§ 2.1511, 2.1513 and 2.1515 of this part. The test unit is not to be adjusted, nor

is the battery to be replaced during these tests, and a log of battery on-time should be maintained. The above tests are to be performed on the same test unit. The tests in § 2.1509 (f) through (i) may be run in any sequence or may be performed on separate test units.

(a) *Vibration test.*

Step (1) Secure the EPIRB to the vibration table. The EPIRB is not to be operated and should not activate while being vibrated.

Step (2) Subject the EPIRB to sinusoidal motion parallel to one of the three major orthogonal axes under the following conditions:

A. Frequency (Hz)	Peak amplitude (mm)
4–10	2.5
10–15	0.8
15–25	0.4
25–33	0.2

B. The frequency is to be changed either linearly or logarithmically with time between 4 Hz and 33 Hz such that a complete cycle (4 Hz to 33 Hz to 4 Hz) takes approximately 5 minutes.

C. The EPIRB is to be vibrated for at least 30 minutes or six complete cycles.

Step (3) Remount the EPIRB, if necessary, and repeat step 2 for each of the other two major orthogonal axes.

Step (4) Upon completion of the test, perform an exterior mechanical inspection and verify operation by turning the unit on and observing the RF power indicator on the unit or monitoring the transmission with a receiver. Record test results.

(b) *Thermal shock tests.* These tests are to be performed on EPIRBs which are required or intended to float.

(1) *Low temperature thermal shock test.*

Step (1) Place the EPIRB in a temperature chamber for at least 3 hours at −20 °C or colder. The EPIRB is not to be operated while being cooled.

Step (2) Immediately place the EPIRB in water that has been maintained at +10 °C or warmer.

Step (3) After 15 minutes, perform as exterior mechanical inspection and verify operation by turning the unit on and observing the RF power indicator on the unit or monitoring the transmission with a receiver. Record test results.

(2) *High temperature thermal shock test.*

Step (1) Place the EPIRB in a temperature chamber for at least 3 hours at +55 degrees C or warmer. The EPIRB is not to be operated while being heated.

Step (2) Immediately float the EPIRB in water that is maintained at +25 degrees C or colder.

Step (3) After 15 minutes, perform an exterior mechanical inspection and verify operation by turning the unit on and observing the RF power indicator on the unit or monitoring the transmission with a receiver. Record test results.

(c) *Salt fog test.*

Step (1) Place the EPIRB in a salt fog chamber for a period of at least 2 hours at a temperature of 35 °C (±2 °C) before exposing it to salt fog. The EPIRB is to be turned off during this test.

Step (2) With the chamber temperature maintained at 35 °C, introduce salt fog at the saturation point for 48 hours. The salt fog is to be prepared from a 5% (±1%) salt (sodium chloride solution. For detailed guidance on the preparation of the solution and the apparatus for generating salt fog, refer to MIL–STD–810D (19 July 1983), method 509.2.

Step (3) Upon completion of the salt fog exposure, the EPIRB is to be airdried at room temperature for 12 hours and operation verified by turning the unit on and observing the RF power indicator on the unit or monitoring the transmission with a receiver. Record observations.

(d) *Drop test.* This test is to be performed on EPIRB which are required or intended to float.

Step (1) Turn the EPIRB on, log the time and drop it three times into water from a height of 20 meters. The water is to be deep enough so that the EPIRB does not touch bottom when dropped. Each drop should be initiated from a different orientation as follows: antenna vertical up; antenna vertical down; antenna horizontal.

Step (2) Upon completion of the drop test, an exterior mechanical inspection is to be performed and operation verified by observing the RF power indicator on the unit or monitoring the transmission with a receiver. Record observations. Turn the test unit off and log the total on-time.

(e) *Forty-eight hour operational test.* This test includes the battery life test and all the electrical tests given in §§ 2.1511, 2.1513 and 2.1515 of this part, at various temperatures. The tests are to be performed on the same EPIRB in the sequence specified herein. Be sure to record the on-time of the unit during each test. No more than 8 hours of total on-time is permitted before commencing step 4. When operating the EPIRB in the environmental chamber, a non-radiating load may be substituted for the antenna provided it is

electrically equivalent to the standard antenna and does not reduce the battery current drain.

Step (1) Perform the radiated emissions test in § 2.1511 of this part.

Step (2) Perform the modulation characteristic tests in § 2.1513 of this part.

Step (3) Perform the spectral tests in § 2.1515 of this part.

Step (4) With the EPIRB off, place unit in an environmental chamber at a temperature of −20 °C for at least 2 hours.

Step (5) With the EPIRB in the chamber, repeat the carrier frequency test in § 2.1515(d) of this part. (Leave the EPIRB turned on.)

Step (6) Near the end of 48 hours of total on-time for the EPIRB, repeat the carrier frequency test in § 2.1515(d) of this part.

Step (7) At the end of 48 hours of total on-time, remove EPIRB from the chamber and immediately repeat the PERP test for the fundamental emissions in § 2.1511(c) of this part. The unit should be maintained at −20 °C to the extent possible for this test.

(f) *Float free and activation test.* This test is required only for Class A EPIRBs.

Step (1) The EPIRB is to be installed in the automatic release mechanism and the assembly is to be mounted on a fixture simulating a deck or bulkhead as per manufacturer' installation instructions.

Step (2) Submerge the fixture in water in its normal mounted orientation. The EPIRB must float free before reaching a depth of 4 meters and should automatically activate. Activation is to be verified by observing the RF power indicator on the unit or monitoring the transmission with a receiver.

If the EPIRB is equipped with an automatically deployable antenna, the antenna must properly deploy during each immersion. Record observations.

(g) *Stability and buoyancy test.* This test is to be performed on EPIRBs which are required or intended to float. This test is to be conducted in fresh water.

Step (1) With the antenna deployed in its normal operating position, submerge the EPIRB in a horizontal position just below the surface of the water.

Step (2) Release the EPIRB and observe the amount of time required for it to come to an upright position. It must reach its upright position within one second from each position.

The EPIRB must have a reserve buoyancy of at least 5% of its gross weight. It must also float upright in calm water with the base of the antenna a minimum of 5 cm above the water. Record the time required for the test unit to right itself.

(h) *Temperature/frequency test.* The frequency stability shall be measured over an ambient temperature from −20° to +55 °C at intervals of not more than 10 °C. A period of time sufficient to stabilize all of the components of the oscillator circuit at each temperture level shall be allowed prior to frequency measurement.

Step (1) Place the EPIRB in the environmental test chamber.

Step (2) Adjust the temperature in the chamber to +20 °C and allow sufficient time for the oscillator to stabilize at that temperature.

Step (3) Measure the carrier frequency in accordance with the procedure in § 2.1515(d) of this part. Record the carrier frequency in Hertz. The carrier frequency at +20 °C is the reference for determining the frequency tolerance.

Step (4) Increase the temperature in the chamber to +55 °C and allow sufficient time for the oscillator to stabilize at that temperature. Measure the carrier frequency using the procedure in § 2.1515(d) of this part.

Step (5) Reduce the temperature in the chamber in 10 °C maximum increments until −20 °C is reached. At each new temperature, allow sufficient time for the oscillator to stabilize at that temperature. Measure the temperature and frequency in each case and plot the frequency vs temperature from −20° to +55 °C.

(i) *Leakage and immersion test.*

Step (1) Completely submerge the EPIRB in water for 48 hours. The EPIRB is to be turned off during this test.

Step (2) Remove the EPIRB from the water and wipe dry.

Step (3) Verify operation by briefly turning the EPIRB on and observing the RF power indicator on the unit or monitoring the transmission with a receiver.

Step (4) Open the EPIRB for examination. There is to be no water inside the unit. Record observations.

§ 2.1511 Measurements of radiated emissions.

The Commission's Rules require that the peak efficetive radiated power (PERP) of a Class A, B or S EPIRB not be less than 75 mW under certain specified conditions. The PERP of an EPIRB transmitter is determined by comparing its level to a reference PERP generated by a standard quarter-wave monopole antenna located on a one

wavelength minimum diameter metal ground plane. The Rules also require that all spurious and harmonic emissions be attenuated by a specified amount with respect to the reference PERP. In addition, there is a limit on the PERP of radiated emissions with the switch in the test mode. These measurements are to be made in accordance with the following procedure.

(a) *General set-up instructions.*

Measurements of radiated electromagnetic emissions (EME) are to be performed on the 30 meter open field test site described in §2.1503(a) of this part and on one of the pair of frequencies listed in §2.1507 of this part. A receiver, tuned dipole antennas and a calibrated signal generator as described in §2.1505 of this part are required. The EPIRB should be powered by its own internal battery with its standard antenna attached and deployed.

(b) *Set-up for radiated EME tests.*

Step (1) Place a 121.5 MHz quarter-wave vertical antenna element at the center of the ground plane and connect the output of the calibrated signal generator to the antenna.

Step (2) Mount the tuned dipole antenna on the antenna mast, tune the elements to 121.5 MHz and connect the antenna to the receiver.

Step (3) After an appropriate warm up, turn the receiver to the frequency of the test unit, set the detector to peak mode and the bandwidth to 100 kHz.

(NOTE: It is sometimes helpful to monitor the receiver audio output with a speaker. The EPIRB signal may be identified by its distinctive modulation.)

(c) *Radiated EME tests.*

Fundamental emissions-peak effective radiated power

Step (1) Turn on the signal generator and adjust the output to 75 mW at 121.5 MHz.

Step (2) Vary the antenna height from one to four meters in both vertical and horizontal polarization. Record the highest receiver reading in dBm as the reference level.

Step (3) Disconnect the signal generator and replace the quarter-wave vertical element on the ground plane with the EPIRB under test. The EPIRB is to be positioned directly on the surface of and in the center of the metal ground plane.

Step (4) Activate the EPIRB.

Step (5) Vary the receive antenna height from one to four meters in both vertical and horizontal polarization. Record the highest receiver reading in dBm and the instrument settings, antenna height and direction for maximum radiation, antenna polarization and conversion factors, if any, associated with that reading.

Step (6) Repeat Step 5 with the EPIRB switch in the test position. Return the switch to the normal operation position.

Step (7) Rotate the EPIRB 30 degrees and repeat Steps 5 and 6. Repeat this step for all successive 30 degrees segments of a full, 360 degree rotation of the EPIRB.

Step (8) Repeat §2.1511(b) and Steps 1 through 7 for 243 MHz.

Step (9) Compute the peak effective radiated power for the maximum level of each measured emission using the following formula:

$$\mathrm{PERP} = 75 \times \log_{10}{}^{-1}\left[\frac{\mathrm{dBm}_{\mathrm{meas-dBmref}}}{10}\right]$$

where:

$\mathrm{dBm}_{\mathrm{meas}}$ is the measured receiver reading in dBm, and

$\mathrm{dBm}_{\mathrm{ref}}$ is the reference receiver reading found in step 2 of §2.1511(c).

Step (10) Record the PERP in mW. The FCC limit for minimum power in the normal operation mode (i.e., with the EPIRB switch in the normal operating position) is 75 mW. The FCC limit for maximum power in the test mode is 0.0001 mW.

Spurious emissions

Step (11) Reset the signal generator to operate at 121.5 MHz.

Step (12) For each spurious and harmonic emission to be measured, retune the receive antenna to the appropriate frequency and repeat Steps 5 and 7.

Step (13) Determine the FCC limit on power for spurious emissions on the frequency of each measured emission as follows:

The rules require that spurious emissions be attenuated at least 30 decibels below the transmit power level. Therefore, the maximum received power limit for a spurious emission can be calculated from the formula:

$$\mathrm{dBm}_{\mathrm{spur}} = \mathrm{dBm}_{\mathrm{meas}} + \mathrm{AF}_{121.5} - \mathrm{AF}_{\mathrm{spur\ freq}} - 30$$

where:

$\mathrm{dBm}_{\mathrm{meas}}$=measured receiver reading (Section 2.1511(c), step 5).

$\mathrm{AF}_{121.5}$=tuned dipole antenna factor at 121.5 MHz.

$\mathrm{AF}_{\mathrm{spur\ freq}}$=tuned dipole antenna factor at spurious freq.

Step (14) Record in dB below the fundamental emissions the level of all spurious and harmonic emissions within 10 dB of the FCC limits.

§ 2.1513 Measurements of modulation characteristics.

(a) *Set-up.* Test of modulation characteristics are to be performed in an RF shielded room.

Step (1) Place the EPIRB directly on a metal ground plane, such as the shielded room floor.

Step (2) Place a suitable receiving antenna at a convenient distance from the EPIRB and connect it to the input of the spectrum analyzer or receiver to observe the radiated signal from the EPIRB.

Step (3) Set the spectrum analyzer or receiver controls as follows:

I.F. bandwidth: 300 kHz minimum
Video filter: OFF or as wide as possible
Amplitude scale: Linear
Frequency: 121.5 MHz
Scan width: 0 Hz

Step (4) Connect the detected output of the spectrum analyzer or receiver to the input of the storage oscilloscope.

Step (5) Set the oscilloscope controls as necessary to allow the demodulated waveform to be viewed. The input signal is to be DC coupled.

(b) *Measurement of Audio Frequencies.*

Step (1) Activate the EPIRB.

Step (2) Trigger the oscilloscope and store at least one complete cycle of the audio waveform.

Step (3) Measure the period (T) of the waveform. The period is the time difference between the half voltage points at the beginning and end of one complete cycle of the waveform. See Figure 2.

Step (4) Calculate the frequency (F), where:

$F=1/T$.

Step (5) Repeat Steps 2 through 4 until the highest and lowest audio frequencies are found.

(NOTE: The lowest and highest frequencies may occur several cycles before or after the transition from low to high frequency.)

Step (6) Determine the audio frequency range (F_{range}), where:

$F_{range}=F_{high}-F_{low}$

Step (7) Record instrument settings and the lowest and highest audio frequencies. Record the audio frequency range in Hertz.

Step (8) Repeat Steps 1–7, above, for 243 MHz.

(c) *Modulation factor.*

Step (1) Activate the EPIRB.

Step (2) Trigger the oscilloscope and store at least one complete cycle of the audio waveform. The input signal is to be DC coupled or erroneous results will be obtained.

Step (3) Measure the maximum voltage (V_{max}), and the minimum voltage (V_{min}) for the cycle. The modulation factor (M) is calculated from the following formula:

$$M=\frac{V_{max}-V_{min}}{V_{max}+V_{min}}$$

See Figure 2.

Step (4) Repeat Steps 2 and 3 until the lowest modulation factor is found.

Step (5) Record instrument settings and the lowest modulation factor, expressed as a ratio between 0 and 1.

Step (6) Repeat the above measurements for 243 MHz.

(d) *Modulation duty cycle.*

Step (1) Activate the EPIRB.

Step (2) Trigger the oscilloscope and store at least one complete cycle of the audio waveform.

Step (3) Measure the period (T) of the waveform. The period is the time difference between the half voltage points at the beginning and end of one cycle of the waveform. See Figure 2.

Step (4) Measure the pulse width (t_p) of the waveform. The pulse width is the time difference between the half voltage points on the rising and falling portions of the waveform. See Figure 2.

Step (5) Calculate the duty cycle (D) as follows:

$$D=\frac{t_p}{T}$$

Step (6) Repeat Steps 2 through 5 a sufficient number of times to determine the highest and lowest duty cycles.

Step (7) Record instrument settings and the highest and lowest duty cycles in percent.

Step (8) Repeat Steps 1–7 for 243 MHz.

(e) *Sweep repetition rate.*

Step (1) Connect a speaker to the detected output of the spectrum analyzer or receiver so the audio frequencies are audible. Alternatively, an FM radio tuned to 108 MHz placed in the vicinity of the EPIRB may be used.

Step (2) Activate the EPIRB.

Step (3) Time the number of audio sweeps (N) for a one minute interval.

Step (4) Calculate the audio sweep rate (R) using $R=N/60$.

Step (5) Record instrument settings and the sweep repetition rate in Hertz.

§ 2.1515 Spectral measurements.

(a) *Set-up.* Spectral measurements are to be performed in a shielded room.

Step (1) Place the EPIRB directly on a metal ground plane, such as the shielded room floor. The EPIRB should be powered by

its own internal battery with its standard antenna attached and deployed.

Step (2) Place a suitable receiving antenna at a convenient distance from the EPIRB and connect it to the input of the spectrum analyzer to observe the radiated signal from the EPIRB. A signal generator and frequency counter capable of operating at 121.5 and 243 MHz are also required for these tests.

(b) *Occupied bandwidth test.*

Step (1) Activate the EPIRB and observe the fundamental frequency on a spectrum analyzer. Adjust location of receiving antenna and spectrum analyzer controls to obtain a suitable signal level (i.e., a level which will not overload the spectrum analyzer, but is far enough above the noise floor to allow determination of whether or not the sidebands are attenuated by at least the amount required in the rules).

Step (2) Set spectrum analyzer controls as follows:

I.F. bandwidth: 10 kHz
Video filter: OFF or as wide as possible
Scan time: 100 ms./div.
Amplitude scale: 10 dB/div.
Scan width: 20 Hz/div.
Center frequency: 121.5 MHz

Step (3) Record the signal level in dbm.

Step (4) Calculate the mean power reference level by adding 10 $\log_{10}$ (D), where D is the modulation duty cycle determined in section 2.1513(d) of this part, to the recorded signal level.

Step (5) Set spectrum analyzer controls as follows:

I.F. bandwidth: 100 Hz
Video filter: OFF or as wide as possible
Scan time: 10 sec./div.
Amplitude scale: 10 dB/div.
Scan width: 20 kHz/div.

Step (6) Check the modulation sidebands for compliance with the required attenuation below the mean power reference level specified in § 80.211 of the rules.

Step (7) Record how the test was performed, instrument settings and the occupied bandwidth in kHz and the 3 dB bandwidth of the carrier in Hz. (See § 2.1517 of this part).

Step (8) Repeat Steps 1 through 7 for the signal at 243 MHz.

(c) *Signal enhancement test.*

The setup specified in § 2.1515(a) is to be used in this method of measuring signal enhancement. Other methods may be used if shown to give results equivalent to or more accurate than this method.

Step (1) Activate the EPIRB and locate the carrier frequency at 121.5 MHz on the spectrum analyzer. Adjust location of receiving antenna and spectrum analyzer controls to obtain a suitable signal level (i.e., a level which will not overload the analyzer, but is far enough above the noise floor to allow sidebands at least 40 dB below the carrier to be viewed).

Step (2) Set the spectrum analyzer controls as follows:

I.F. bandwidth: 10 kHz
Video filter: OFF or as wide as possible
Scan time: 100 ms./div.
Amplitude scale: 5 dB/div.
Scan width: 10 kHz/div.
Center frequency: 121.5 MHz

Step (3) Record the amplitude in dBm.

Step (4) Calculate the total power output by adding 10 log(D), where D is the modulation duty cycle determined in § 2.1513(d) of this part, to the recorded signal level.

Step (5) Set the spectrum analyzer controls as follows:

I.F. bandwidth: 60 Hz or less
Video filter: OFF or as wide as possible
Scan time: 10 sec./div.
Amplitude scale: 5 dB/div.
Scan width: 20 Hz/div.
Center frequency: 121.5 MHz

Step (6) Measure and record the carrier power dBm as displayed on the spectrum analyzer.

Step (7) Calculate the ratio of carrier power to total power from Steps 4 and 6 using the following formula:

$$\frac{\text{carrier power}}{\text{total power}} = \log_{10}{}^{-1}\left[\frac{dB_c - dB_T}{10}\right] \qquad \begin{array}{l} dB_C = \text{carrier power in step 6} \\ dB_T = \text{total power in step 4} \end{array}$$

Step (8) Record instrument settings, sample calculation and the percent of power within ±30 Hz at 121.5 MHz or ±60 Hz at 243 MHz of the carrier frequency.

Step (9) Repeat the above measurement Steps 1 through 8 for 243 MHz. For the higher frequency, the I.F. bandwidth in step 5 must be 120 Hz or less.

(d) *Carrier frequency test.*

The setup specified in §2.1515(a) is to be used in measuring the carrier frequency.

Step (1) Activate the EPIRB and locate the 121.5 MHz signal on the spectrum analyzer. Adjust location of receiving antenna and spectrum analyzer controls to obtain a suitable signal level.

Step (2) Set the spectrum analyzer controls as follows:

I.F. bandwidth: 100 Hz
Video filter: OFF or as wide as possible
Scan time: 10 sec./div.
Amplitude scale: 10 dB/div.
Scan width: 20 Hz/div.
Center frequency: 121.5 MHz

Step (3) Combine the output of the signal generator with the EPIRB signal at the input to the spectrum analyzer.

Step (4) Adjust amplitude and frequency of signal generator output to determine center of carrier frequency component.

Step (5) Measure signal generator frequency with frequency counter with accuracy of 5 PPM or better and record as carrier frequency.

Step (6) If applicable, change the type of modulation of the EPIRB and record the shift in carrier frequency as observed on the spectrum analyzer display.

Step (7) Repeat the above measurement Steps 1 through 6 for 243 MHz.

[56 FR 11683, Mar. 20, 1991; 60 FR 47302, Sept. 12, 1995]

DATA RECORDING/REPORTING REQUIREMENTS

§ 2.1517 Data recording/reporting requirements.

The test report for an EPIRB shall contain the following information:

(a) Specific identification, including the FCC ID, model and serial numbers, of the EPIRB under test.

(b) The name and location of the test sites used for the measurements.

(c) A description of the instrumentation and equipment, including antennas, used to perform the tests. For purchased equipment, the type, manufacturer and model number are generally sufficient as a description.

(d) The test results and associated comparative information.

(e) A description of any modifications made to the EUT or other system components during the testing.

(f) A description and justification of all deviations from the procedures described herein.

(g) The name and qualifications of the person responsible for the tests.

(h) The date the tests were performed.

(i) A statement signed by the individual responsible for the test that the EPIRB as tested complies or does not comply with the applicable FCC rules.

(j) A statement signed by the individual responsible, either directly or indirectly, for production or marketing of the device tested that the unit tested is representative of the equipment that all be marketed.

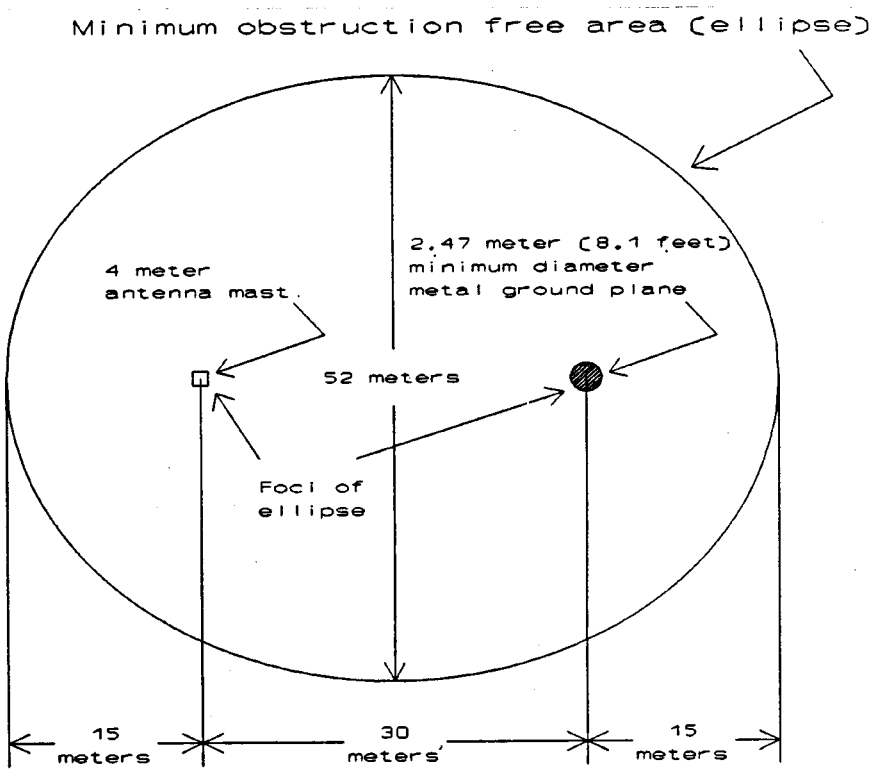
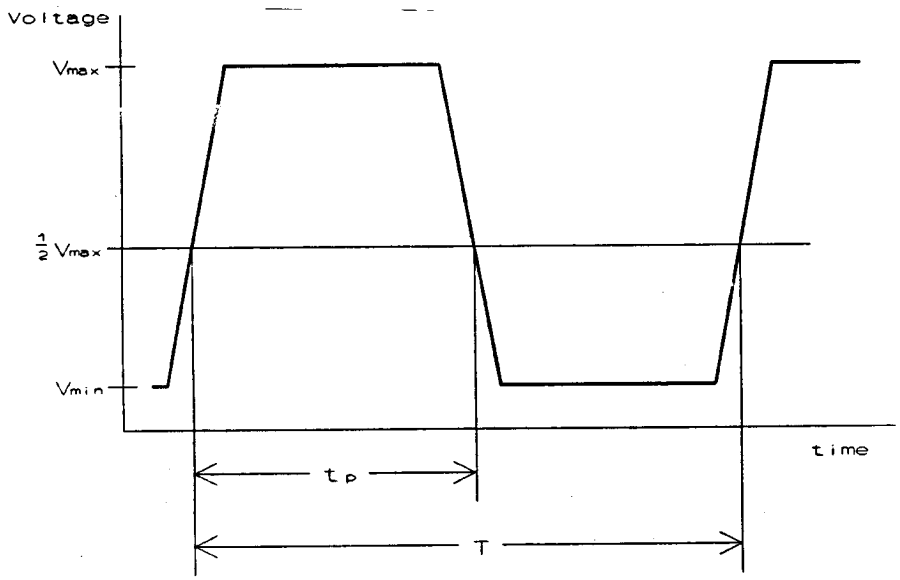


Figure 1 - Measurement Site



Frequency: $f = \frac{1}{T}$

Duty cycle: $D = \frac{t_p}{T}$

Modulation factor: $M = \frac{V_{max} - V_{min}}{V_{max} + V_{min}}$

Figure 2 - Typical Audio Waveform

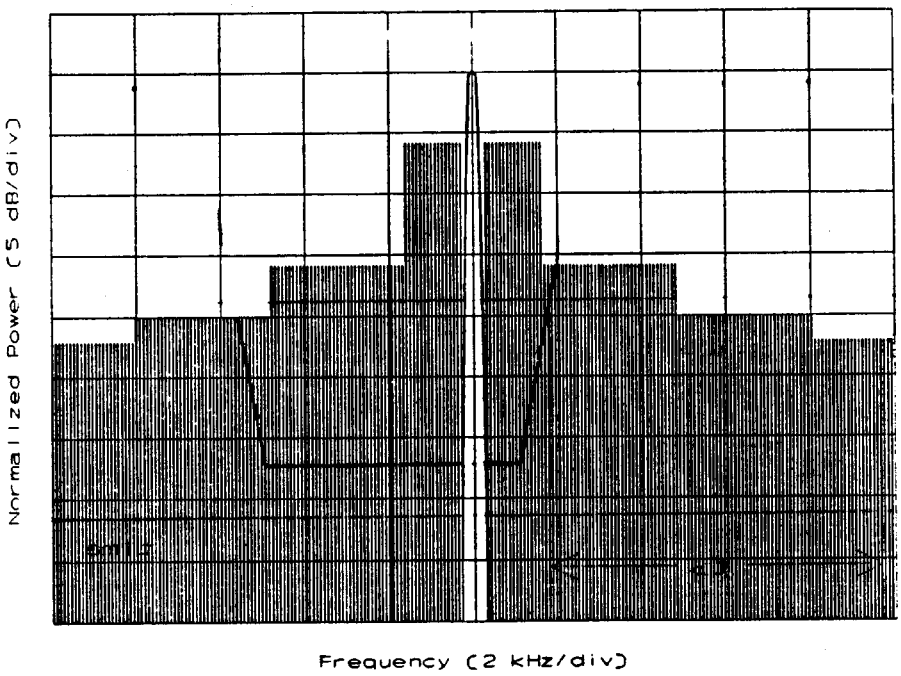


Figure 3 - Example of ideal EPIRB Spectrum

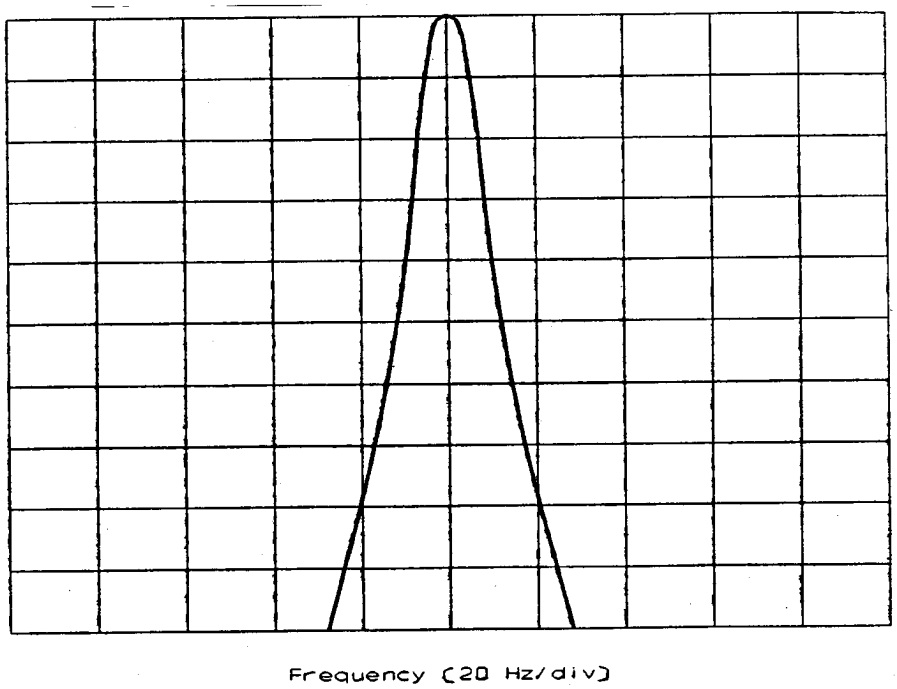


Figure 4 – Example of EPIRB Carrier Component