CHAPTER 6

Principle and Procedures for the Assignment and Coordination of Frequencies

6.1 FREQUENCY ASSIGNMENT PRINCIPLES

6.1.1 Frequency Sharing

1. Sharing of frequencies is necessary for the fullest utilization of the radio spectrum. This may entail the acceptance of some interference but does not contemplate requiring the acceptance of harmful interference.

2. In order to have available the greatest possible spectrum support for future radiocommunication requirements, each new frequency assignment should be made in such a way that the increase in the total spectrum space committed is as small as possible. Accordingly, it shall be the normal practice, where feasible and consistent with frequency allocation and assignment plans, to assign radio frequencies to more than one radio installation when sharing the frequency would not significantly impact use of the frequency by any of the licensees.

6.1.1.1 Stations Located in Close Geographic Proximity

In general, the inherent right of the station first established is recognized as regards a proposed new station whether transmitting or receiving. Nevertheless, for stations located in close geographic proximity and particularly in the case of installations involving very high effective radiated powers (50 kW or greater), digital system receivers having high carrier to noise ratio requirements or receivers intended for reception of very low level radiation (-100 dBW or less), engineering solutions may require the cooperation of all licensees involved in the application of reasonable and practicable measures within the state of the art to avoid causing or being susceptible to harmful interference.

6.1.1.2 Relative Priority of Frequency Assignments

1. Priority, unless specifically qualified, is the right to occupy a specific frequency for authorized uses, free of harmful interference from stations of other licensees.

2. The relative status between radio services and between frequency assignments with respect to their conformity to the Table of Frequency Allocations is indicated in Part 4.1 of these Regulations.

3. Unless specifically agreed otherwise at the time a frequency assignment is made, the relative priority between two frequency assignments which are substantially equal is determined by their dates of assignment. The frequency assignment with the earlier date has priority over the frequency assignment with the later date.

4. If a frequency assignment is renewed, the applicable date of assignment for priority purposes is the original date from which continuous authorization has been in effect. If the particulars of an

existing assignment are expanded (e.g., expansion of bandwidth, addition of new receiver antenna location, increase in power), the applicable date of assignment for priority purposes is the date on which the expanded particulars were authorized.

5. The priority of a mobile station applies only in the geographical area designated in the particulars of the frequency assignment

6. The priority of a fixed station applies only at the geographical locality of the receiver antenna location designated in the frequency assignment.

7. Experimental classes of stations and classes of stations in support of experimental operations are on a secondary basis to stations of all other services.

6.1.1.3 Authorized Area of Operations of Mobile Stations

For an assignment to a land station and one or more mobile stations, the area described under receiver ANTENNA LOCATION for the reception of transmissions from the land station by the mobile stations shall be considered also as the area in which transmissions from the mobile stations, associated with the land station, are authorized.

6.1.2 Planned Frequency Utilization

In the interest of planned and orderly utilization of the radio frequency spectrum, FSM government departments and state governments are encouraged to inform the Department of Transportation, Communications and Infrastructure of planned frequency utilization.

6.1.3 Consideration of Applications

Recognizing that the demand for radio frequencies in some frequency bands exceeds the supply, and to make the most efficient and orderly use of available frequencies in the national interest, frequency assignment action is predicated on consideration of all available data, including international regulations, national laws, established Government policies, national interest, availability of other possible communication facilities, and technical aspects.

6.1.4 Withholding Funds Pending Availability of Frequency Support

The obligation of funds by FSM government departments for the development or procurement of communication-electronic equipments, requiring the assignment and protection of radio frequencies for their use, should be withheld pending assurance of the availability of appropriate frequency assignment support. This is particularly important in the selection of sites and frequencies for earth and terrestrial stations to be operated in bands co-equally shared by space and terrestrial services.

6.2 PROGRAMS TO DETERMINE HOW THE SPECTRUM IS USED

6.2.1 Frequency Assignment Review Program

The Department of Transportation, Communications and Infrastructure shall maintain a program of continuing review of frequency assignments to its radio stations and shall delete or amend such

assignments as appropriate. The objectives of this program are a) to ensure that frequency assignments are in current use by the licensees and are correctly reflected in the frequency assignment list, (b) to ensure that frequency assignments are required for continued operations for the purpose stated in their justification, and c) to ensure that frequency assignments are still qualified for authorization under the provisions of the regulations contained in these Regulations.

6.2.2 Spectrum Measurement Program

1. A spectrum measurement program has been established. The purposes of the program are a) to determine whether radio installations are utilizing authorized frequencies and are operating in accordance with applicable regulations, b) to provide information to help determine whether additional uses can be made in a particular band at a particular location, and c) to provide information to prevent or resolve cases of interference between two or more users.

2. The use of radio frequencies by licensees is subject to observation and measurement by the Department of Transportation, Communication and Infrastructure.

6.2.3 Inspection of Radio Installations

All radio installations are subject to periodic inspection. A program to survey radio frequency usage has been established. The objectives of this program are to determine at the operational level the degree of implementation of the applicable provisions of these Regulations, whether frequency usage is in accordance with authorizations, and to exchange information with a view toward improving spectrum management in general. Inspections are conducted by the Department of Transportation, Communication and Infrastructure personnel by means of on-site observation of communication-electronic facilities and discussions with licensees.

6.2.4 Spectrum Resource Assessment Program

The Department of Transportation, Communication and Infrastructure manages a program to assess spectrum use and to identify potential spectrum sharing problems within specific frequency bands. The objectives of this program include (1) the review and documentation of the characteristics and deployment of existing and proposed systems in specified bands, (2) the identification of potential band sharing problems which may impact on the efficient use of the spectrum, (3) the evaluation of any identified electromagnetic compatibility problems, and (4) the identification of alternative spectrum management approaches to resolving these problems. These studies may be used in the development of spectrum use policies.

6.2.5 Notification of Discontinuance of Service

Assignment of a frequency to a particular station or class of station imposes upon the assignee the responsibility of duly notifying the Department of Transportation, Communication and Infrastructure of proposed discontinu-

ance of a station or a material change in character of service rendered.

6.2.6 Guidance on Use of Frequencies by Stations in Certain HF Bands

1. WARC-79 and WARC-92 adopted a number of allocation changes in the 3000-27500 kHz portion of the radio frequency spectrum. The changes reduce the spectrum allocated for the fixed and mobile services and increase the spectrum allocated for HF broadcasting. The effective implementation dates for the expanded radio services will vary over a long period of time; due to the complex reaccommodation process and access restrictions that vary by band. WRC-95 made available for use the HF broadcasting spectrum allocated by WARC-79, effective 1 January 1996. The use of this spectrum is on the basis of Article **S12** and taking into account the provisions of RR **S5.148.**

2. WARC-79 allocated the following HF Bands to the broadcasting service on a primary basis. Exceptionally, fixed service assignments in the bands 9775-9900, 11650-11700, and 11975-12050 kHz, meeting the criteria of RR **S5.147**, may be retained.

kHz	kHz
9775-9900	15450-15600
11650-11700	17550-17700
11975-12050	21750-21850

3. WARC-92 allocated the following HF bands to the broadcasting service on a primary basis, with an implementation date of 1 April 2007. In these bands, the broadcasting service is limited to single-sideband emissions and characteristics, specified in ITU RR Appendix **S11**, and subject to planning procedures contained in Article **S12**:

kHz	kHz
5900-5950	13570-13600
7300-7350	13800-13870
9400-9500	15600-15800
11600-11650	17480-17550
12050-12100	18900-19020

After 1 April 2007, continued use of these bands by the fixed and mobile services is internationally governed by the provisions of RR **S5.136**, **S5.143**, **S5.146** and **S5.151** as applicable. Additionally, Resolution 21 provides for implementation of these bands for broadcasting by a future WRC and the reaccommodation of "Class of Operation A" frequency assignments contained in the Master International Frequency Register as of 1 April 1992. Resolution **S21** also provides for a transition period from 1 April 1992 to 1 April 2007. The following principles should be adhered to when making fixed and mobile service assignments in these bands:

a. Avoid internationally notifying assignments to the fixed and mobile services. If assignments are notified they are subject to review by the BR on 1 April 2007 to determine if they are in conformity with the Table of Frequency Allocations and other provisions of the Radio Regulations.

b. Review assignments of "Class of Operation A" in order to determine if they can be downgraded to "Class of Operation B or C".

c. Identify "Class of Operation A" assignments during the transition period and move them to appropriate frequency bands with notification to the BR. In this regard if only the assigned frequency and no other characteristics of

the assignment are changed, the assignment will retain its original date.

d. New frequency assignments that are only required for a short period of time or until 1 April 2007, not requiring international protection, should be made in these bands so that the remaining HF bands allocated to the fixed and mobile services can be used to accommodate "Class of Operation A" assignments.

6.2.7 Assignment of a Band of Frequencies to a Station

When a band of frequencies is assigned to a station, e.g., 400-406 MHz, the necessary bandwidth of the station shall be so located within the band that it does not extend beyond the upper or lower limits of the band.

6.2.8 Limitation of Radiated Power

Radio station licensees shall radiate only as much power as is necessary to ensure a satisfactory service.

6.2.9 Use of Ionosphere Sounders

1. The use of ionosphere sounders for realtime selection of frequencies for operational communication circuits, real-time monitoring of upper atmosphere phenomena, and for the predicting of propagation conditions will be authorized only under the following conditions:

a. When it has been determined that no existing authorized ionosphere sounder transmitter is capable of meeting the requirement under a common user concept.

b. Operations shall be on a secondary basis to authorized radio services.

c. Transmissions in the bands 2495-2505, 4995-5005, 9995-10005, 13360-13410, 14990-15010, 19990-20010, 21850-21870, 24990-25010, 25550-25670 kHz and 3E.00-3E.25 MHz shall be avoided for sounders capable of frequency suppression.

d. Transmissions shall be swept or stepped through the operating range of the equipment at a rate or time interval expected to avoid harmful interference.

e. Transmitters shall be designed to eliminate emissions on any frequency channel where harmful interference is caused to authorized radio services.

2. Applications for frequency assignments to sounder network stations or sounder prediction stations shall include the following basic information:

a. Channeling plan(s) (required for all sounder network stations and, as applicable, for sounder prediction stations)[i]

b. Pulse duration(s)

c. Pulse repetition frequency(ies)

d. Pulse per channel

e. Scan rate(s)

f. Scan interval(s) (time between scans)

g. Antenna type(s)

h. Antenna azimuth

i. Antenna orientation(s) (If directional, indicate orientation of major lobe.)

3. All applications for sounders shall include a statement that the applicant has determined that no existing authorized ionosphere sounder transmitter is capable of meeting the requirement.

6.2.10 Use of Frequencies in the Bands Between 2850 and 22000 kHz Allocated Exclusively to the Aeronautical Mobile Service

1. The bands allocated exclusively to the aeronautical mobile service are subdivided into categories defined in Article **S43** of the RR as follows:

a. Frequencies in any band allocated to the aeronautical mobile (R) service are reserved for communications related to safety and regularity of flight between any aircraft and those aeronautical stations primarily concerned with flight along national or international civil air routes.

b. Frequencies in any band allocated to the aeronautical mobile (OR) service are reserved for communications between any aircraft and aeronautical stations other than those primarily concerned with flight along national or international civil air routes.

2. National planning for the use of these bands is governed by the provisions of Article **S43** and Appendices **S20** and **S27** of the RR. These appendices allot specific (R) channels for use in particular areas, allot specific (OR) channels for use by particular countries, and set forth technical and operational principles governing this usage.

Aeronautical Mobile (R) Bands

3. Frequency assignments to stations in the aeronautical mobile (R) service, in the bands allocated exclusively to that service between 2850 and 22000 kHz, shall be assigned in conformity with the provisions and the allotment plan of Appendix **S27** to the RR. Such assignments shall conform to the plan for the allotment of frequencies to (a) Major World Air Route Areas (MWARA's), (b) Regional and Domestic Air Route Areas (RDARA's), (c) VOLMET Allotment Areas, and (d) Worldwide Allotment Areas contained in Appendix **S27** or, to meet operational requirements not otherwise met by the Allotment Plan, comply with the provisions of Appendix **S27** for the adaptation of allotment procedures (**S27**/20, **S27**/21 and **S27**/22). Assignments in support of International Air Routes (MWARA and VOLMET allotments) are also within the purview of applicable ICAO frequency assignment plans that have been agreed internationally and are recognized in the ITU Radio Regulations.

4. Single sideband operations only are permitted in the bands allocated exclusively to the Aeronautical Mobile (R) Service in accordance with the provisions of Appendix **S27** Part I, Section II, C. This section of Appendix **S27** also contains information on the use of several emissions subject to compliance with special provisions applicable to each use.

Aeronautical Mobile (OR) Bands

5. Frequencies in bands allocated exclusively to the (OR) service are internationally allocated to countries by Appendix **S26** of the RR, which also establishes sharing criteria, protection ratios, and other technical and operational principles. These principles recognize the possible necessity for the adaptation of the allotment plan to meet valid requirements of the various administrations, provided these adaptations do not decrease the protection to frequencies assigned in strict adherence to the plan.

Channels Common to the Aeronautical Mobile (R) and (OR) Services

6. Section 7.5.3 authorizes aircraft, ships, and survival craft stations to use the channels common to the (R) and (OR) services, carrier (reference) frequencies 3023 and 5680 kHz, provided such use is in accordance with Appendix **S13** Part A2, Section I, D, §3 and Appendix. **S13** Part A2, Section I, F, § 5 of the RR, the appropriate provisions of Appendices **S27**. Section 7.5.4 authorizes additional uses by mobile stations engaged in coordinated search and rescue operations. Any use of these channels by land stations engaged in the coordination of search and rescue operations shall be in accordance with the same provisions, and shall be authorized by applications submitted and processed through normal assignment procedures.

6.2.11 Use of Radio Frequencies to be in Accordance with ITU Provisions

Except as otherwise provided in these Regulations or by the terms of a frequency authorization, present or future, the use of radio frequencies by radio station licensees shall be in accordance with the provisions of the ITU Constitution and Convention and Radio Regulations.

6.2.12 Radiation Hazards

1. Personnel responsible for the operation of telecommunication equipment should be aware that exposure to high intensity levels of RF and other nonionizing electromagnetic energy presents potential health hazards. Actions should be taken, consistent with existing safety guides and applicable official standards duly promulgated and prescribed by the United States, to ensure that personnel are protected from such hazards. Although biological effects of electromagnetic radiation have been studied, current knowledge and understanding of these hazards is incomplete, particularly as regards possible hazards of prolonged exposure to microwave and lower frequency radiations at intensity levels below those shown to produce measurable heating. Research in this field is continuing.

2. At present, most safety guidelines and criteria are intended to protect against adverse aspects on body tissues that can occur when the rate of induced heating exceeds the organism's dissipative capacity. Previous studies of heating effects at sufficiently high energy levels (around and above 100 mW/cm^2) led to the fairly general acceptance of 10 mW/cm^2 as a safe level below which such injury from heating would not be expected to occur. This value has thus been used as the basis for various safety criteria and standards, some of which are referenced.

a. References:

(1) The United States Department of Labor Occupational Safety Standard for Nonionizing Radiation, Federal Register, Vol 37, October 18, 1972.

(2) Swanson, J. R., et al., “A Review of International Microwave Exposure Guides,” American Industrial Hygiene Association Journal, September/October 1970, available from NTIS as PB195772.

(3) Glaser, Z., “Bibliography of Reported Biological Phenomena (“Effects”) and Clinical Manifestations Attributed to Microwave and Radio Frequency Radiation,” U.S. Naval Medical Research Institute, Research Report No. 2, Project MF12.524.015-

0004B, October 1971, available from DDC as AD734391.

(4) Moore, W. Jr., "Biological Aspects of Microwave Radiation--A Review of Hazards," U.S. Department of Health, Education, and Welfare (DHEW), July 1968; TSB-68-4.

(5) Setter, L.R., et al., "An Annotated Bibliography of Regulations, Standards, and Guides for Microwaves, Ultraviolet Radiation, and Radiation from Lasers and Television Receivers," DHEW, PHS No. 999-RH-35, April 1969.

(6) "Laser/Maser Hazards," U.S. Air Force Regulation No. 161-24, January 12, 1967.

(7) "Safe Laser Radiation Exposure Levels," letter from the Office of the Surgeon General, USAF, April 12, 196E.

(8) "Control of Microwave Health Hazard," Navy Bureau of Medicine and Surgery, Instruction 6470.13A, January 28, 1977.

3. In the event that measurement capabilities are required to determine the nature of exposure or suspected hazards from nonionizing electromagnetic radiation, there are a number of U. S. Government agencies that have the necessary equipment and expertise. These capabilities are indicated in the document, "Nonionizing Radiation Measurement Capabilities State and Federal Agencies." This document is maintained by the U.S. Environmental Protection Agency (EPA). The point of contact at EPA is:

Chief, Electromagnetic Radiation Analysis Branch
Environmental Protection Agency
Room 519B, Waterside Mall East
401 M Street, S.W.
Washington, D. C. 20460
Telephone: 202-755-1188 (or 301-427-7604 for the field laboratory in Silver Spring, Maryland

6.2.13 Use of Frequencies by Stations in the Maritime Mobile Service

1. Stations in the maritime mobile service utilize bands allocated either exclusively to this service or on a shared basis with other services. Several international plans detail the specific uses of certain frequencies. The maritime mobile service is provided with detailed operational and frequency regulations contained in the ITU RR. In addition, an abstracted manual which includes pertinent ITU Radio and Telegraph and Telephone Regulations entitled "Manual for Use by the Maritime Mobile Service," is issued by the ITU, and should be carried by ships (RR Appendix **S16**).

2. National planning for the use of the maritime mobile bands closely follows the international use. Exceptions are indicated in the National Table of Frequency Allocations (see Chapter 4) and as noted herein. For the bands 4-27.5 MHz, the assignable frequencies listed in RR Appendix **S17** Part A for each maritime mobile function are delineated in Annex H.

Maritime Mobile Telegraphy

3. Ship stations use working frequencies in the bands 415-490 kHz and 510-535 kHz, specified by RR **S52.39**, for transmissions to coast stations. Coast stations transmit on other frequencies in these bands. Initial contact is usually established by calling on 500 kHz and shifting to appropriate working frequencies. Special provisions

for morse telegraphy calling allow the use of 512 kHz when 500 kHz is being used for distress (RR **S52.41-S52.44**). All ship stations equipped with narrow-band direct-printing to work in these bands shall be able to receive class F1B emissions on 518 kHz, if complying with the provisions of RR Chapter SVII (GMDSS). (See RR **S51.45** and **S52.97**).

4. Frequencies in the bands between 4 and 27.5 MHz, allocated exclusively for this service, are used for several telegraphy modes. The frequency sub-bands available for assignment for each mode to coast and ship stations shall be as specified in RR **S52.12, S5213**, and Appendix **S17**. Coast station frequencies for Maritime Safety Information (MSI) use are listed in Annex H (Table 11).

5. Several limitations apply to use of frequencies in the exclusive maritime mobile bands between 4 and 27.5 MHz:

a. Power limits for coast stations are:

(1) Single Channel A1A or F1B emissions (RR **S52.56** and **S52.104**):

Maximum Power (kW)

Band (MHz)	A1A (pX)	F1B (pY)
4	10	5
6	10	5
8	20	10
12	30	15
16	30	15
18	No A1A	15
22	30	15
25	No A1A	15

(2) Multichannel telegraphy (RR **S52.172**):

2.5 kW (mean) per 500 Hz bandwidth

(3) For digital selective calling and acknowledgement, and for types of transmissions other than those indicated in (1) or (2) above, the maximum mean power shall not exceed the power specified for F1B emission in (1) above.

b. Power limits for ship stations:

Except for transmissions, in the exclusive maritime mobile bands between 4 and 27.5 MHz, of digital selective calls and acknowledgements, which are limited to a mean power of 1.5 kW, international radio regulations have no power limit for ship stations (MS) operating in the radiotelegraphy mode. The power used should be the minimum power, consistent with transmitter capability, necessary to provide satisfactory communications. The power listed in Annex H is not intended to serve as a power limit, but is a guide reflecting current practice.

c. RR Appendix **S17** provides for ship and coast use in several functional allocations:

(1) *Wideband telegraphy, facsimile and special transmission systems*--Assignments to ship stations using wideband telegraphy, facsimile and special transmission systems may be adjusted to meet needs of systems using these bands provided they remain within the band limits (RR **S52.170**). The shared use of certain of these ship station frequencies between Government and non-Government shall be in accordance with US296. See Annex H, Table 3 for frequencies available to ship stations and Annex H, Table 10 for frequencies available to coast stations.

(2) *A1A Morse calling*--See Annex H, Table 7 for frequencies available.

(3) *Oceanographic data transmission*--Use of these frequencies is limited to the transmission of oceanographic and meteorological data from ships and buoys. Oceanographic data interrogating stations may use these

frequencies for interrogation of ships and buoys. The power of ship stations used for oceanographic data transmission (Station Class OD), including buoys or other sensor platforms, is limited to 100 Watts. See Annex H, Table 4 for frequencies available.

(4) *Narrowband direct-printing telegraph and data transmission systems*--See Annex H, Tables 5 and 6 for frequencies available.

(a) Narrowband direct-printing telegraph--International technical standards for narrowband direct printing telegraphy systems are contained in ITU-R M.476-5 and shall be used nationally.

(b) Data transmission systems--Standards for data transmission systems have not been established by the ITU.

(5) *A1A Morse working*--See Annex H, Table 9 for frequencies available.

(6) *Digital selective calling*--See Annex H, Tables 8 and 11 for frequencies available.

Maritime Mobile Radiotelephony

6. Bands available to the maritime mobile service for radiotelephony are divided generally into exclusive maritime bands and bands shared with other services. The class of emission authorized in each band is described below. Where single sideband is specified, the authorized bandwidth is 2.8 kHz, upper sideband mode only is permitted, the assigned frequency must be 1.4 kHz above the carrier, and technical standards of ITU-R M.1173 shall be followed. Where FM is specified, technical standards of ITU-R M489-2 shall be followed. The principal bands within which maritime mobile radiotelephony may be authorized are:

a. 1605-3500 kHz--Portions of these bands are allocated to the Maritime Mobile Service exclusively, while other portions are shared with the fixed, mobile, and other services. Class J3E emission only may be authorized for ship and coast stations.

(1) Coast stations shall be limited to 5 kW PEP when located north of 32° N and 10 kW peak envelope power (PEP) when located south of 32° N.

(2) The use of J3E emission is encouraged on carrier frequency 2182 kHz; however, H3E emission is also authorized for communications with foreign ship and coast stations (Appendix **S13**, Part A2, Section I, C § 2). Class A3E emission on this frequency is no longer authorized except for such apparatus (at ship stations) provided solely for distress, urgency and safety purposes (**S51.53**).

(3) Digital selective calling for distress and safety purposes shall be conducted on the frequency 2187.5 kHz. Digital selective calling for other than distress and safety purposes may be conducted on 2189.5 kHz (ship-to-shore) and 2177 kHz (ship-to-ship and shore-to-ship).

(4) Provisions for the use of the single sideband radiotelephone channels within the band 2170-2173.5 kHz and 2190.5-2194 kHz are:

(a) The assignable frequencies are
2171.9 and 2192.4 kHz.

(b) Emission is limited to J3E.

(c) Power is limited to 400 Watts PEP.

b. 4.0-23.0 MHz--Nationally and internationally only single sideband class J3E emission may be authorized. The PEP of ship stations shall not exceed 1.5 kW. The PEP of coast stations shall not

exceed 10 kW. Within these limitations, frequencies in certain cases, are available to the maritime mobile service in exclusive bands for duplex and simplex use as set forth below:

(1) *Duplex*--Both ship station and coast station single sideband frequencies are designated in RR Appendix **S17**, Part A, Section I, Subsection A, on a paired basis, as shown in Annex H, Table 1. In addition, RR Appendix **S25** provides an international frequency allotment plan by areas for use of those frequencies designated in Appendix **S17,** Part A, Section I, Subsection A. International notification of allocated channels are made in accordance with the provisions of ITU Appendix **S25** and Article **S17**.

(2) *Simplex*--The frequencies of RR**S17** Part B, Section I, Sub-section B as shown in Annex H, Table 2 may be authorized for use on a simplex basis by coast and ship stations. Additionally, the assigned frequencies 4126.4, 441E.4 and 6517.4 kHz also may be so authorized. The use of 6517.4 kHz for this purpose should be limited to day-time operation. Simplex frequencies may be authorized for both ship/coast stations and intership communications. Intership operations may be on two frequencies if they are cross banded. Power for these simplex frequencies shall not exceed 1 kW peak, and emission is limited to class J3E.

c. *156-162 MHz*--Within these limits, the band is divided into numbered channels which are listed in RR Appendix **S18**, along with recommended use.

(1) The band 157.0375-157.1875 MHz is divided into six channels. Two of these channels have a specialized use. Channel 22, 157.1 MHz, is the primary frequency for liaison communications with the U.S. Coast Guard. Channel 81, 157.075 MHz, is primarily for environmental protection operations as outlined in Section 7.5.6 of these Regulations.

(2) The remainder of the VHF channels in the band 156-162 MHz available for specific purposes. Several of those purposes are as set forth below:

(a) Channels 12 and 14, 156.6, 156.7 MHz, and the Channel 20 duplex pair, 157.0 and 161.6 MHz, may be authorized for port operations.

(b) Channel 6, 156.3 MHz, may be authorized for intership operations. It is also authorized for coordinated operations at the scene of a SAR incident as outlined in Section 7.5.4. Coast stations may use 156.3 MHz for exchange of traffic dealing with safety of life or property when other means of communication are not practicable.

(c) Channel 13, 156.65 MHz, may be authorized for bridge-to-bridge operations according to provisions set forth hereafter.

(d) Channel 16, 156.8 MHz, is designated nationally and internationally for distress, safety and calling. Ship and coast stations, during their hours of service of VHF radiotelephony, shall maintain a watch for reception of 156.8 MHz whenever practicable.

(e) For public correspondence purposes ship stations are authorized to communicate with public correspondence coast stations. In these instances, the ship station shall transmit on the designated ship frequency appropriate to the public correspondence channel assigned to the coast station.

(3) Stations on board aircraft may communicate with stations of the maritime mobile service. The communications of an aircraft station shall be brief and limited to operations in which maritime mobile stations are primarily involved, and where direct

communications between aircraft and the ship or coast station is required.

(a) The mean power of aircraft stations shall not exceed five Watts, however, a power of one Watt or less shall be used to the maximum extent possible.

(b) While using the frequency band the altitude of aircraft stations should not exceed 305 meters (1000 feet) except for reconnaissance aircraft participating in ice-breaking operations where an altitude of 457 meters (1500 feet) is allowed. The frequencies 156.3 and 156.8 MHz may be used by aircraft stations for safety purposes only.

(4) Stations operating in the maritime mobile service in the band 156-162 MHz are subject to the technical standards and power limitations of Sections 5.3.2 and 5.2.1.

7. *Radiotelephone Installation.* Each vessel shall be fitted with radiotelephone installations that are capable of effectively transmitting and receiving G3E emissions on at least the following VHF channels:

Channel 16--156.8 MHz (Distress, safety and calling)

Channel 6--156.3 MHz (Primary intership)

Channel 13--156.65 MHz
(Navigational bridge-to-bridge)

Channel 12--156.6 MHz

Channel 14--156.7 MHz

a. Additionally, such other frequencies as required for the vessel's service and to include the capability to receive VHF-FM marine navigation warnings for the area of operation.

b. The radiotelephone station, exclusive of the antennas and source of electric energy, shall be located as high as practicable on the vessel, preferably on the bridge.

c. The principal operating position of the radiotelephone installation shall be on the bridge, convenient to the conning position.

d. Where the radiotelephone station is located elsewhere than on the bridge, provision shall be made for complete operational control of the equipment at that location and at the bridge operating position. However, provision shall be made to take immediate and complete control of the equipment at the bridge operating position.

e. Provision shall be made for illuminating the operating controls at the principal operating position.

f. Means shall be provided for charging any storage battery used in connection with the radiotelephone station.

g. The radiotelephone transmitter shall be capable of delivering at least 10 Watts carrier power to the antenna. Provision shall be made to reduce this power readily to one Watt.

h. The radiotelephone receiver shall have a sensitivity of at least two microvolts across 50 ohm or equivalent input terminals, for a 20 decibel signal-to-noise ratio.

i. The associated antennas shall be effective, vertically polarized, and located as high as practicable on the masts or superstructure of the vessel. The transmission line shall be effective and, to the extent practicable, shall impose a minimum loss.

j. The radiotelephone installation is subject to the technical standards in Chapter 5 of these Regulations.

E. *Vessel Bridge-to-Bridge Watch.* Each vessel shall, when underway, maintain a continuous and effective watch on channel 13 (156.65 MHz).

a. Sequential monitoring techniques alone are not sufficient to meet this requirement.

b. Portable VHF equipment may be used to meet this requirement.

c. This watch shall be maintained by the master, or person designated by the master, who may perform other duties provided they do not interfere with the effectiveness of the watch.

9. The UHF frequencies and technical standards for on-board communication stations as provided by RR **S5.287**, **S5.288** and ITU-R **M.1174**, respectively are:

a. The preferred two simplex (duplex) frequencies for use for on-board communications are paired as follows:

On-Board Communications

On-Board Repeater (Transmit) (MHz)	On-Board Mobile (Transmit) (MHz)
457.525	467.750
457.550	467.775
457.575	467.800
457.600	467.825

b. Technical characteristics:

(1) Effective radiated power not to exceed 2 Watts. Whenever practicable the equipment should include a device to readily reduce the power by at least 10 dB.

(2) In the case of equipment installed at a fixed point on the ship, the height of antenna shall not be more than 3.5 meters (approximately 10 feet) above the highest working deck.

(3) Only FM with a pre-emphasis of 6 dB/octave (phase modulation) shall be used.

(4) Deviation not to exceed ±5 kHz.

(5) Tolerance shall be 5 parts in 10^6.

(6) The audio-frequency band shall be limited to 3000 Hz.

6.2.14 Coordination of High Frequencies for Projects and Systems Involving Oceanographic Data Transmissions

1. Radio frequencies in the bands 4063.3-4064.8, 6261.3-6262.5, 8340.3-8341.5, 12420.3-12421.5, 16617.3-1661E.5, and 22240.3-22241.5 kHz used for transmission and reception of oceanographic data require specialized coordination procedures.

2. Accordingly, any operational use of the Appendix **S17** oceanographic data transmission frequencies should be in accord and/or compatible with the Plan(s) developed by the IOC/WMO, if international protection and BR registration are desired.

6.2.15 Procedure in a Case of Harmful Interference

1. In the use of the radio frequency spectrum, interference must be expected; however, the acceptance of harmful interference is not contemplated.

2. Harmful interference is "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 Regulations." (RR)

3. When harmful interference is received, the following actions should be taken in the absence of agency instructions to the contrary:

a. Determine the source, if possible. The Department of Transportation,

Communication and Infrastructure can assist in determining the source of harmful interference and may be contacted directly for such assistance.

b. If the source is identified, try to eliminate the harmful interference by dealing directly with individuals located at the source.

c. If direct action is impracticable or unsuccessful, report the circumstances to the Department of Transportation, Communication and Infrastructure.

4. In taking any of these actions, provide all possible information concerning the interference. An interference report should include as much of the following as practicable:

a. Particulars concerning the station causing the interference:

(1) Name or call sign
(2) Frequency measured
(3) Class of emission
(4) Bandwidth
(5) Station class
(6) Bearing
(7) Nature of interference

b. Particulars concerning the transmitting station whose transmissions are being interfered with:

(1) Name or call sign
(2) Frequency assigned
(3) Frequency measured
(4) Class of emission
(5) Bandwidth
(6) Station class
(7) Geographic location

c. Particulars furnished by the receiving station experiencing the interference:

(1) Name or call sign
(2) Station class
(3) Geographic location
(4) Dates and times of occurrence of harmful interference

d. Other information

6.2.16 Conversion of Stations in the Aeronautical Mobile Service to SSB or ISB Transmission

In the bands below 30 MHz, equipment procured for the aeronautical mobile service shall be capable of single sideband or independent sideband emission with suppressed or reduced carrier. In the case of stations in the aeronautical mobile (R) service, the use of single sideband shall be determined by the international requirements pertaining to that service.

6.2.17 Trunked Land-Mobile Radio Systems

1. Trunked land-mobile radio systems may be established in any frequency band allocated on a primary basis to the fixed and mobile services. Accommodating a trunked system requires consolidation of existing land mobile systems by the applicant(s) unless they present justification.

2. Innovative methods of using commercial entities to design and operate trunking systems are encouraged. Frequency assignments for shared trunked land-mobile radiocommunication systems shall be obtained by the installing entity, which is responsible for managing the system. Individual users are not required to obtain frequency assignments to share the system.

6.2.18 Specialized Mobile Radio Service

1. FSM Government Departments and State Governments are authorized to use the Specialized Mobile Radio (SMR) services in the land mobile bands only as

an END USER of a licensed private carrier on a contractual basis. SMR systems are established by private commercial carriers and licensed by the Department of Transportation, Communications, and Infrastructure. FSM Government Departments and State Governments are encouraged to evaluate the efficiency and cost effectiveness between leasing an SMR service, establishing a new land mobile radio system, or expanding their existing system to satisfy their operational requirements.

6.2.19 Coordination of Frequencies Used by FSM Government Departments with State or Local Governments

1. An FSM Government radio station may use any frequency authorized to a State or Local Government where such utilization is necessary for intercommunication or required for coordination of activities, provided a mutually-approved arrangement has been concluded between the Government department concerned, and the licensee involved.

2. Two steps are required to conclude a mutually-approved arrangement. The Government department must obtain from the licensee a written certification that the Government operation is necessary, and, after receipt of the certification, the Government department must provide a copy of the certification to the Department of Transportation, Communication and Infrastructure to obtain a license.

6.2.20 Shared Use of Frequencies for Meteorological Aids in the Bands 400.15-406 and 166E.4-1700 MHz

1. The characteristic frequency drift of radiosonde equipment and the requirement for flexibility in the operation of radiosondes preclude effective suballocation, channeling, or the granting of authority to use specific frequencies in the bands 400.15-406 and 166E.4-1700 MHz. The shared use of these bands corresponds essentially, for interference considerations, to shared use of a single nominal centerband frequency assignment.

2. Interference to the meteorological aids service that can result in spoiled observations is, by the nature of the service and the resources usually available, inherently difficult to identify and locate.

3. Mutual interference is possible between radiosondes operating simultaneously within 160 kilo- meters of each other. Line-of-sight distance to the horizon is greater than 480 kilometers from a radiosonde at an altitude of 15 kilometers.

4. Since these bands are available for the use by any entity responsible for the conduct of meteorological observations, each user shall take appropriate measures to avoid interference through local coordination of specific operations.

Endnotes for Chapter 6

i. Stations operating in a radio service on a secondary basis shall comply with the provisions of this Chapter with respect to stations operating in a radio service allocated on a primary basis.

ii. e.g.--First octave: 2.075 to 3.975 MHz, 20 channels spaced 100 kHz.
Second octave: 4.150 to 7.950 MHz, 20 channels spaced 200 kHz.
Third octave: E.300 to 15.900 MHz, 20 channels spaced 400 kHz.
Fourth octave: 16.600 to 31.800 MHz, 20 channels spaced 800 kHz.
For those sounders in which the tuning rate is independent of the pulse rate (e.g., Sounder Types C2, C3, and C4) wherein the specific frequencies sounded differ from scan to scan, a channeling plan is not a meaningful item. On applications for such sounders, so state.

iii. Space stations in the broadcasting-satellite service on geostationary satellites operating in the band 11.7-12.7 GHz are exempted from these provisions but shall maintain their positions in accordance with Appendix 30 of the Radio Regulations.

iv. Transmitting antennas of space stations in the broadcasting-satellite service operating in the band 11.7-12.7 GHz are not subject to these provisions but shall maintain their pointing accuracy in accordance with 3.14.1 of Annex 8 of Appendix 30 of the Radio Regulations.