Regulation Organizing the Registration and Utilization of Frequencies and Radio Equipment and Their Pricing

Spectrum Management Unit
ISO 9001:2008 and ISO 27001:2005 Certified
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His Majesty Sultan Qaboos Bin Said

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Decision No. 133/2008 issuing the regulation organizing the registration and Utilization of frequencies and radio equipment and their pricing*

Pursuant to the Telecommunications Regulatory Act issued by the Royal Decree No. 30/2002 and;

The Executive Regulation of the Act issued by the Ministerial Decision No. 10/2007 and;

The Decision No. 46/2003 on Radio Frequency Registration and Utilization Fees and Fees of some Radio Licenses and;

The Decision No. 198/2007 regulating the exemption of WAS/RLANS from Radio Licensing and;

The Decision No. 55/2008 on regulation of GSM services (1800 MHz) on board aeroplanes and;

The Decision No. 90/2008 regulating the licensing of Stations and Radio Equipment Operation and;

The Authority's approval dated 17/9/2008 and;

Based on the exigencies of the public interest;

* This decision and attached regulation have been modified by Decision No. 25/2012 issued on 22nd of Jan 2012

It is decided:

Article 1: The provisions of the attached regulation shall come into force in respect of organizing the registration and utilization of frequencies and radio equipment and their pricing.

Article 2: Without prejudice to the provisions of (Article 5 repeated 1) of the Telecommunications Regulatory Act referred to, the military and security bodies shall comply with payment of radio frequency registration fees only.

Article 3: The following shall be exempted from the provisions of Article 1 of this Decision:

1. Traditional and coastal fishing boats owned by individuals, provided that the maximum load capacity does not exceed 50 tons and length does not exceed 30 meters.
2. Users of radio frequencies when alternative frequencies are assigned instead of the frequencies decided to be vacated by the Authority.

Article 4: Duration of the license to use or possess radio equipment shall be for one year (Twelve months). The validity of the license to use radio equipment may be extended for a maximum period of five years after an advance payment of fees is made for the whole period on the approval of the application. The radio license may also be issued for a period less than a year based on the exigencies of the public interest or based on the licensee's request to unify the expiry dates of all or some of the radio licenses issued to the licensee. The Authority will not be bound by the date specified in the application submitted by the licensee, and the licensing fees of the remaining periods will be calculated proportionately with the annual usage fees according to the radio services.

The effective licensing date shall start from the purchasing date of the equipment from the dealers in radio equipment that are registered with the Authority or from the arrival date of the equipment to the Omani soil in case of importation from abroad.

Article 5: Without prejudice to the provisions of Article No. 90/2008 cited above, the Authority may issue temporary licenses the validity and fees of which are to be determined in accordance with the attached regulation. The license shall be automatically cancelled upon the expiry of its duration.

Article 6: The provisional approval issued by the Authority for radio license applicant that enables him to identify the radio frequencies and the technical characteristics and data approved to be used for purposes of programming the radio equipment by the manufacturer and their importation to Oman shall not be considered a license to use the radio equipment. The duration of this approval shall only be limited to three months and the Authority may, based on a substantiated request, approve its extension for further three months. In case of non-importation of equipment, or non-provision of the radio equipment serial numbers to the Authority within this period, the provisional approval shall be deemed expired and the applicant shall submit a fresh application to obtain the radio license pursuant to the applicable procedures.

Article 7: An application requesting change of frequency, increase of power, increase of transmission capacity, change of location or increase of antenna height will be considered as a new application requiring payment of all the consequent fees payable for registration and utilization of new radio frequencies.

Article 8: A one month grace period starting from the license expiry date shall be granted for payment of the prescribed fees for renewal of the radio license. In case of delay of fee payment, the penalty set out in the attached regulation shall be applicable for each month of delay up to twelve months. Where the delay is part of a month, the fee shall be calculated proportionately based on the period of delay to a month. If no payment is made during this period, the license will be revoked and the radio equipment will be seized and legal actions stipulated in the Act will be taken.

Article 9: A grace period of two months shall be given for payment of fees for registration of assigning new frequencies and licensing new radio equipment. If no payment is made during this period, the application shall be deemed cancelled and the applicant will be required to file a new application for assignment and usage of frequencies and radio equipment.

Article 10: A grace period of one month shall be given for payment of fees for licensing of radio equipment used in ships, boats and planes. In case of delay of fee payment, the penalty set out in the attached regulation shall be applicable. Where the delay is part of a month, the fee shall be calculated proportionately based on the period of delay to a month.

Article 11: The Authority may periodically review and amend the annexes attached to this regulation if so required by the recommendations and resolutions of the ITU and the international organizations and in accordance with market requirements and technological development.

Article 12: Decisions No. 46/2003, 198/2007 and 55/2008 referred to shall be repealed, as well as all that is in contravention with the provisions of this Decision.

Article 13: This Decision shall be published in the Gazette and shall come into force with effect from 1 January, 2009.

Article (1)

The following words and expressions shall have the meanings set out opposite them unless otherwise required by the text

Location

A location of a fixed station is defined through its exact geographical co-ordinates, which consist of latitude, longitude and height above mean sea level. Latitude and longitude shall be given in degrees (°), minutes (‘) and full seconds (‘’) which allow to localise the station within a range of uncertainty of less than 30 m. These values may be expressed in equivalent decimal format as well. “Height above mean sea level” shall be given with an accuracy of 10 m or less.

- Number of Locations

The number of locations is to be determined as follows:

a. In case of fixed stations, “number of locations” is the total amount of fixed stations at different sites (geographical locations).

b. In case of mobile stations, “number of locations” refers to the number of Wilayats where the mobile stations are licensed to be operated. A list of the Wilayats can be found in Annex A.

- Governorates

governorates are to be understood as the governorates of the Sultanate of Oman (as per Annex B).

- Coverage Zone Factor

The coverage zone factor (CZF) is a measure for population density in a Wilayat. There are three CZFs corresponding to high, medium, and low population density. The CZF is determined by the location of the transmitter site, irrespective of actual coverage.

A list indicating the assignment of the Population Density to the Wilayats is presented in Annex A.

- Frequency

Frequency is defined as the number of periods per unit of time of a transmitter’s electromagnetic emission measured in kHz, MHz or GHz.

- Bandwidth

Bandwidth is defined as the difference in kHz or MHz between the uppermost and lowermost frequencies of a band of a transmitter’s electromagnetic emission.

- Power

The power of a transmitter’s electromagnetic emission, measured in dBW is defined as follows:

1 - EIRP

Equivalent Isotropically Radiated Power – the product of the power supplied to the antenna and its gain in a given direction relative to an ideal referenced isotropic antenna (absolute or isotropic gain).

2 - ERP

Effective Radiated Power – the product of the power supplied to the antenna and its gain relative to a half-wave dipole in a given direction. The loss-free reference antenna is isolated in space whose equatorial plane contains the given direction.

- Relations between the above definitions:

ERP	=	EIRP	–	2.15 dB
EIRP	=	ERP	+	2.15 dB

Note: The above values are only applicable for the main direction of radiation.

Operation Modes

1. Simplex Operation

Mode of operation where transmission is made possible alternately in each direction of a telecommunication channel, for example, by means of manual control.

2. **Duplex Operation**

   Mode of operation where transmission is possible simultaneously in both directions of a telecommunication channel.

3. **Semi-Duplex Operation**

   Mode of operation which is simplex operation at one end of the circuit and duplex operation at the other.

4. **Frequency Division Duplex**

   Mode of operation which uses different channels, i.e. different frequencies, and is therefore comparable to duplex operation from the viewpoint of frequency usage.

5. **Time Division Duplex**

   Mode of operation which uses one channel both ways (alternately), and is therefore comparable to simplex operation from the viewpoint of frequency usage.

Note: For charging, the number of frequencies (channels) is important (and not the type of operation) but, e.g., simplex operation using two different frequencies (channels) counts the same as semi-duplex or duplex operation.

Service: The list of radio services as defined by the ITU.

- 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 radio beacon stations may also participate in this service on designated distress and emergency frequencies.

- Aeronautical Mobile (OR) Service

an aeronautical mobile service intended for communications, including those relating to flight coordination, primarily outside national or international civil air routes.

- Aeronautical Mobile (R) Service

an aeronautical mobile service reserved for communications relating to safety and regularity of flight, primarily along national or international civil air routes.

- Aeronautical Mobile-Satellite Service

aa mobile-satellite service in which mo¬bile earth stations are located on board aircraft; survival craft stations and emer¬gency position-indicating radio beacon stations may also participate in this service.

- Aeronautical Mobile-Satellite (OR) Service

an aeronautical mobile-satellite service intended for communications, including those relating to flight coordination, primarily outside national and international civil air routes.

- Aeronautical Mobile-Satellite (R) Service

an aeronautical mobile-satellite service reserved for communications relating to safety and regularity of flight, primarily along national or international civil air routes.

- Aeronautical Radio Navigation Service

a radio navigation service intended for the benefit and for the safe operation of aircraft.

- Aeronautical Radio Navigation-Satellite Service

a radio navigation-satellite service in which earth stations are located on board aircraft.

- Aeronautical Station

a land station in the aeronautical mobile service.

- Aircraft Station

a mobile station in the aeronautical mobile service, other than a survival craft station, located on board of an aircraft.

- Amateur Service

a radiocommunication service for the purpose of self training, intercommunication and technical investigations carried out by an amateur, that are duly authorized persons interested in radio technique solely with a personal aim and without pecuniary interest.

- **Amateur-Satellite Service**

  a radiocommunication service using space stations on earth satellites for the same purpose as for amateur services.

- **Broadcasting Service**

  a radio communication service in which the trans¬missions are intended for direct reception by the general public. This service may include sound transmission, television transmission or other types of transmission.

- **Broadcasting-Satellite Service**

  a radio communication service in which signals transmitted by space stations are intended for direct reception by the general public.

- **Coast Station**

  a land station in the maritime mobile service.

- **DECT**

  an ETSI standard for portable phones, commonly used for domestic or corporate applications. DECT can also be used for wireless data transfer. It works like a cellular system. DECT shows one major difference when compared to GSM: the cell radius is only 25 – 100 m, while GSM operates in a 2 – 10 km range. The system operates with 10 carriers in the range 1,880 – 1 900 MHz.

- **Earth Exploration-Satellite Service**

  a radio communication service between earth stations and one or more space stations, which may include links between space stations, in which:

  Information relating to the characteristics of the Earth and its natural phenomena, including data relating to the state of the environment, is obtained from active sensors or passive sensors on earth satellites;

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

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

  Platform interrogation may be included.

  This service may also include feeder links necessary for its operation.

- **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.

- **Fixed Service**

  a radio communication service between specified fixed points.

- **Fixed-Satellite Service**

  a radio communication service between earth stations at given positions, when one or more satellites are used; the given position may be a specific point or any fixed point within specified area; 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 radio communication services.

- **GMPCS**

  GMPCS is a personal communication system providing transnational, regional or global coverage from a constellation of satellites accessible with small and easily transportable terminals. Regardless of the GMPCS satellite systems being geostationary or non-geostationary, fixed or mobile, broadband or narrowband, global or regional, they are capable of providing telecommunication services directly to end users. GMPCS services include two-way voice, fax, messaging, data and even broadband multimedia. E.g., Inmarsat, Thuraya, Globalstar and Iridium are to be treated in line therewith.

- **GSM**

  GSM is a cellular network of the second generation (2G). Mobile phones connect to it by searching for cells in the immediate vicinity. GSM networks oper¬ate mainly in two different frequency ranges in the 900 MHz or 1800 MHz band.

  In the 900 MHz band, the uplink frequency band is 890 – 915 MHz, and the downlink frequency band is 935 – 960 MHz. These 25 MHz bandwidth are subdivided into 124 carrier frequency channels, each spaced 200 kHz

apart. Time division multiplexing is used to allow eight full-rate or sixteen half-rate speech channels per radio frequency channel. There are eight radio timeslots (giving eight burst periods) grouped into what is called a TDMA frame. Half rate channels use alternate frames in the same timeslot. The channel data rate is 270.833 kbit/s, and the frame duration is 4.615 ms.

The 1800 MHz band uses 1,710 – 1,785 MHz for uplink and 1,805 – 1,880 MHz for downlink; the resulting bandwidth of 75 MHz is subdivided into 374 channels with similar specifications as above.

The transmission power of the handset is limited to a maximum of 2 W in the GSM900 band and to 1 W in the GSM1800 band.

- **Inter-Satellite Service**

  a radio communication service providing links between artificial earth satellites.

- **Land Mobile Service**

  a mobile service between base stations and land mobile station or between land mobile stations.

- **Land Mobile-Satellite Service**

  a mobile-satellite service in which mobile earth stations are located on land.

- **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 radio beacon stations may also participate in this service.

- **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 radio beacon stations may also participate in this service.

- **Maritime Radio Navigation Service**

  a radio navigation service intended for the benefit and for the safe operation of ships.

- **Maritime Radio Navigation-Satellite Service**

  a radio navigation-satellite service in which earth stations are located on board ships.

- **Meteorological Aids Service**

  a radio communication service used for meteorological, including hydrological, observations and exploration.

- **Meteorological-Satellite Service**

  an earth exploration-satellite service for meteorological purposes.

- **Mobile Service**

  a radio communication service between mobile and land station, or between mobile stations.

- **Mobile-Satellite Service**

  a radio communication service: Between mobile earth stations and one or more space stations, or between space stations used by this service; this service may also include feeder links necessary for its operation.

- **Model Radio Control**

  radio control (sometimes abbreviated R/C) is the use of radio signals to remotely control a device. The term is used fre¬quently to refer to the control of model cars, boats, airplanes, and heli¬copters from a hand-held radio transmitter. Industrial, military, and scien¬tific research organisations make use of radio-controlled vehicles as well.

- **Near-Field Communication (NFC)**

  a short-range, high frequency, wireless communication technology which enables the exchange of data between devices over an about 10 cm distance. It operates at 13.56 MHz and transfers data at up to 424 kbit/s.

- **Pager**

  a pager is a simple personal telecommunications device for short messages. A one-way numeric pager can only receive a message consisting of a few digits, typically a phone number that the user is then expected to call. Alphanumeric pagers are also available, and two-way ones can send email or text messages as well as receive them.

- **Port Station**

a coast station in the port operations service.

- **Public Service**

services to be received by the general public (audio, video and data transmissions). The definition includes presentations transmitted in encoded form or receivable for a special payment.

- **Radio Astronomy Service**

a service involving the use of radio astronomy.

- **Radio Determination Service**

a radio communication service for the determination of the position, velocity and/or other characteristics of an object, or the obtaining of information relating to those parameters, by means of the propagation properties of radio waves.

- **Radio Navigation Service**

a radio determination service for the purpose of navigation, including obstruction warning.

- **Radio Navigation-Satellite Service**

a radio determination-satellite service for the purpose of radio navigation.

- **Radio Service**

a service involving the transmission, emission and/or reception of radio waves to specific telecommunication purposes.

- **Radiocommunication Service**

a service involving the transmission, emission and/or reception of radio waves for specific telecommunication purposes. Unless otherwise stated, any radiocommunication service relates to terrestrial radiocommunication.

- **Radiodetermination-Satellite Service**

a radiocommunication service for the purpose of radiodetermination involving the use of one or more space stations. This service may also include feeder links necessary for its own operation.

- **Radiolocation Service**

a radiodetermination service for the purpose of radiolocation.

- **Radiolocation-Satellite Service**

a radiodetermination-satellite service used for the purpose of radiolocation. This service may also include the feeder links necessary for its operation.

- **RFID**

an automatic identification method, relying on storing and remotely retrieving data using devices called RFID tags or transponders.

An RFID tag is an object that can be applied to or incorporated into a product, animal, or person for the purpose of identification using radio waves. Some tags can be read from several meters away and beyond the line of sight of the reader.

- **RLAN**

an apparatus/method for routing data in a radio data communication system having one or more host computers, one or more intermediate base stations, and one or more RF terminals. It organises the intermediate base stations into an optimal spanning-tree network to control the routing of data to and from the RF terminals and the host computer efficiently and dynamically. Communication between the host computer and the RF terminals is achieved by using the network of intermediate base stations to transmit the data.

- **Safety Service**

a radiocommunication service used permanently or temporarily for the safeguarding of human life and property.

- **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.

- Short Range Radar

typically, such applications are found in the road traffic field, either from fixed stations to control velocity of land vehicles or from vehicles to check the distance to obstacles (fixed or moving).

- Space Operation Service

a radio communication service concerned exclusively with the operation of space craft, in particular space tracking, space telemetry and space telecommand.

- Space Research Service

a radiocommunication service in which spacecraft or other objects in space are used for scientific or technological research purposes.

Special Service

a radiocommunication service, not otherwise defined, carried on exclusively for specific needs of general utility, and not open to public correspondence.

- 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.

- Standard Frequency and Time Signal-Satellite Service

a radiocommuni¬cation service using space stations on earth satellites for the same purpose as those of standard frequency and time signal service. This service may also include feeder links necessary for its operation.

- UMTS

UMTS, the third generation (3G) of cellular networks combines several air interfaces, GSM's Mobile Application Part (MAP) core, and the GSM family of speech codecs. In the most popular cellular mobile telephone variant of UMTS, W-CDMA is currently used.

UMTS over W-CDMA uses a pair of 5 MHz channels. The specific frequency bands originally defined by the UMTS standard are 1,885 – 2,025 MHz for the mobile-to-base (uplink) and 2,110 – 2,200 MHz for the base-to-mobile (downlink).

A major difference between UMTS and GSM is the air interface forming GSM/EDGE Radio Access Network (GeRAN). It can be connected to various backbone networks like the Internet, ISDN, GSM or to a UMTS network. GeRAN includes the three lowest layers of the OSI model. The network layer (OSI 3)

protocols form the Radio Resource Management protocol (RRM). They manage the bearer channels between the mobile terminals and the fixed network including the handovers.

- UMTS-TDD

a mobile data network standard built upon the UMTS 3G cellular phone standard, using a TD-CDMA or TD-SCDMA or other 3 GPP approved air interface which uses time division multiplexing to duplex spectrum between the uplink and the downlink.

- WAS

an end-user radio connection to public or private core networks. Technologies in use today for implementing wireless access include cellular, cordless telecommunication, and wireless local area network systems.

Article (2)

2.1 Application Fee

The Application Fee is a service-independent one-time fee and is to be paid on submission of an application according to the following:

- (50) Fifty Riyal for each application for the usage of aircraft and ship stations.
- (50) Fifty Riyal for each frequency per location for other services.

It is non-refundable in case the applicant does not wish to continue the licensing procedure.

2.2 Survey Fee

A Survey Fee shall be collected for the actual visit of any number of locations for one application in any wilayat of any governorate or region according to the following:

Governorate	Survey Fee (OMR)
Muscat Governorate	50
Muscat Governorate Al-Batinah North Governorate, Al-Batinah South Governorate, Al-Buraimi Governorate, Al-Dakhliyah Governorate, Al-Dhahirah Governorate, Al-Sharqiyah North Governorate, Al-Sharqiyah South Governorate and Al-Wusta Governorate	100
Dhofar Governorate and Musandam Governorate	200

Table 1 – Survey Fee

2.3 Registration Fee

The Registration Fee is a one time fee (non-recurring). It is for the entire assignment period and is due upon notification of the frequency assigned to the applicant by the TRA.

As registration fees are service-dependent, the individual registration fee applicable is indicated in the respective service section. When a licence is granted and consequently the registration fee becomes due, the application fee is credited against the registration fee. In cases where the application fee is higher than the registration fee, the payment of the application fee replaces the registration fee and it is non-refundable fee.

2.4 Utilisation Fee

The Utilisation Fee is to be paid per year in advance.

The utilisation fee for short wave broadcasting is to be paid in advance for each season (six months).

The utilisation fee applicable is service-dependent, and is indicated in the respective service section.

Article (3) Registration and Utilisation Fee Calculation Factors

3.1 Basic Fee

To determine the Basic Fee, reference is made to the line which indicates the effective radiated power (ERP) of the equipment concerned. In the adjacent columns, the related basic fee for the respective mode of operation is indicated.

Radiated Power (ERP)	Simplex	Duplex and Half Duplex
up to 6 W	OMR 15	OMR 30
more than 6 and up to 50 W	OMR 30	OMR 60
more than 50 and up to 500 W	OMR 45	OMR 90
more than 500 W and up to 5 kW	OMR 60	OMR 120
more than 5 kW and up to 50 kW	OMR 75	OMR 150
more than 50 kW	OMR 90	OMR 180

Table 2 – Basic Fee

The effective radiated power is considered to be equal to the transmitter output power in case of antennas having a gain of less than 1 dB.

3.2 Channel Units and Weighting Factors

The table below shows the width of the channel units in the respective frequency ranges:

Frequency Range	Channel Unit
up to 29.7 MHz	3.125 kHz
above 29.7 MHz to 960 MHz	12.5 kHz
above 960 MHz to 3 GHz	125 kHz
above 3 GHz to 10 GHz	250 kHz
above 10 GHz to 16 GHz	375 kHz
above 16 GHz to 43.5 GHz	500 kHz
above 43.5 GHz	5 MHz

Table 3 – Channel Units

In case an application is filed for two overlapping frequency ranges, the calculation shall be made separately for each frequency range as per the following table:-

Number of Channels	Weighting Factor
1	9
2	10
4	11
8	12
16	13
32	14
64	15
125	16
250	17
500	18
1,000	19
2,000	20

Table 4 – Weighting Factors

Article (4):

Low power equipment is defined as follows: The equipment

- has an EIRP lower than or equal to 100 mW max.;
- is not exempted from fees as defined in Annex C. (in which case it is exempted from licensing requirements).

The following registration fee for low power equipment shall be applicable:

Type of Fee	Amount in OMR
Registration Fee	50
Utilisation Fee	50% of the respective service fee

Table 5 – Low Power Equipment, Registration & Utilisation Fee

Article (5) :

A list of fee-exempted services is given in Annex C. Notwithstanding fee exemption, other mandatory requirements like type approval have to be met.

Article (6) :

The following fees are collected in advance in case of application of licence modification or cancellation or issue of duplicate license or retention of the radio equipment. If the fees were not collected in advance and prior to the expiry of the radio license, the application shall be deemed void, and the license shall be renewed automatically.

Type of Fee	Amount in OMR
Licence Modification Fee	(15) for each time amendment
Licence Cancellation Fee	(25) per license
Retention Fee (for maximum period of three years and after that the license shall be renewed or cancelled)	(25) per radio
Licence Duplicate Fee	(10) per license

Table 6 – Licence Modification, cancellation, retention and licence duplicate issue Fee

Modification Fees are applicable in cases where changes which reduce the consumption of radio resources or are

of administrative character only are affected.

Changes of technical parameters which do not reduce the consumption of radio resources, e.g., if an increase in power, antenna height or bandwidth, or a change of frequency is requested, are not considered a licence modification but require a new application.

Article (7)

In case of non-renewal of the licence (including payment delay) or any other fees, a penalty of 5% per month is applicable and it is calculated up to twelve months (60% from the fees) and after that the license will be cancelled, the radio equipment will be confiscated and a legal action will be taken

Article (8)

The following services fees are collected as per the formulas mentioned bellow.

Annex I provides a cross reference index for finding the appropriate fee.

8.1 Broadcasting Services

8.1.1 Broadcasting Services Radio and TV except SW

- **Registration Fee**

The following registration fee per radio or TV broadcasting station shall be applicable:

Registration Fee = Weighting Factor * OMR 4 (National coordination)
Registration Fee = Weighting Factor * OMR 20 (if international co-ordination is necessary)

Table 7 – Broadcasting Services – Radio and TV except SW, Registration Fee

- **Utilisation Fee**

The following annual utilisation fee per radio or TV broadcasting station shall be applicable:

Utilisation Fee =
Basic Fee Broadcasting + (Service Factor * Power Factor * Coverage Zone Factor)

Table 8 – Broadcasting Services – Radio and TV except SW, Utilisation Fee

In this formula, the basic fee, the service factor, the power factor and the coverage zone factor are determined as follows:

Basic Fee Broadcasting	OMR
Radio	350
TV	600

Table 9 – Broadcasting Services – Radio and TV except SW, Basic Fee

Broadcasting Service		Service Factor
Analogue Audio	LF	1
	MF	1
	FM	2
Digital Audio	DRM MF	3
	DRM HF	3
	DAB, DMB	5
Analogue Video	TV	9
Digital Video	DVB-T	24
	DVB-H	9

Table 10 – Broadcasting Services – Radio and TV except SW, Service Factor

Power Factor
Power Factor = ERP expressed in dBW

Table 11– Broadcasting Services – Radio and TV except SW, Power Factor

Population Density (see Annex A)	Coverage Zone Factor
high	1.0
medium	0.7
low	0.5

Table 12 – Broadcasting Services – Radio and TV except SW, Coverage Zone Factor

8.1.2 Broadcasting Services – SW

- **Registration Fee**

The following registration fee per SW broadcasting frequency shall be applicable (per broadcasting season):

Registration Fee = Weighting Factor * OMR 20

Table 13 – Broadcasting Services – SW, Registration Fee

In this formula, the Weighting Factor is determined as per tables 3 & 4

- **Utilisation Fee**

The following seasonal utilisation fee per SW broadcasting station shall be applicable (per broadcasting season (= 6 months)):

Utilisation Fee / Season = (Basic Fee Broadcasting + (Service Factor * Power Factor * Coverage Zone Factor)) * 0.5

Table 14 – Broadcasting Services – SW, Utilisation Fee

In this formula, the Basic Fee, the Service Factor, the Power Factor and the Coverage Zone Factor are determined as follows:

Basic Fee Broadcasting	OMR
Radio	350

Table 15 – Broadcasting Services – SW, Basic Fee

Broadcasting Service		Service Factor
Analogue Audio	SW	1

Table 16 – Broadcasting Services – SW, Service Factor

Power Factor
Power Factor = ERP expressed in dBW

Table 17 – Broadcasting Services – SW, Power Factor

Population Density	Coverage Zone Factor
high	1.0

Table 18 – Broadcasting Services – SW, Coverage Zone Factor

8.2 Broadcasting Satellite Service

8.2.1 Uplink to Satellites

- **Registration Fee**

The following registration fee per uplink station shall be applicable:

Registration Fee = OMR 500

Table 19 – Broadcasting Satellite Service (uplink), Registration Fee

- **Utilisation Fee**

The following annual utilisation fee per uplink station shall be applicable:

Utilisation Fee = OMR 6,000

Table 20 – Broadcasting Satellite Service (uplink), Utilisation Fee

8.3 Earth Exploration-Satellite Services

8.3.1 Earth Exploration Satellite Service (active) – Earth Station

- **Registration Fee**

The following registration fee per active earth station shall be applicable:

Registration Fee = OMR 500

Table 21 – Earth Exploration Satellite Service (active) – Earth Station, Registration Fee

- **Utilisation Fee**

The following annual utilisation fee per active earth station shall be applicable:

Utilisation Fee = OMR 6,000

Table 22 – Earth Exploration Satellite Service (active) – Earth Station, Utilisation Fee

8.3.2 Earth Exploration Satellite Service (passive) – Earth Station

- **Registration Fee**

The following registration fee per passive earth station shall be applicable:

Registration Fee = OMR 50

Table 23 – Earth Exploration Satellite Service (passive) – Earth Station, Registration Fee

- **Utilisation Fee**

The following annual utilisation fee per passive earth station shall be applicable:

Utilisation Fee = OMR 600

Table 24 – Earth Exploration Satellite Service (passive) – Earth Station, Utilisation Fee

8.3.3 Meteorological Satellite Service – Earth Station

- **Registration Fee**

The following registration fee per earth station of the meteorological satellite service shall be applicable:

Registration Fee = OMR 50

Table 25 – Meteorological Satellite Service – Earth Station, Registration Fee

- **Utilisation Fee**

The following annual utilisation fee per earth station of the meteorological satellite service shall be applicable:

Utilisation Fee = OMR 600

Table 26 – Meteorological Satellite Service – Earth Station, Utilisation Fee

8.4 Fixed Services

8.4.1 Fixed Services except Microwave Links

- **Registration Fee**

The following registration fee for fixed services shall be applicable:

Registration Fee = Number of Locations * Weighting Factor * 4 OMR (for national co-ord.) Registration Fee = Number of Locations * Weighting Factor * 20 OMR (for int. co-ord.)

Table 27 – Fixed Services except Microwave Links, Registration Fee

In this formula, the Weighting Factor is determined as tables 3&4

- **Utilisation Fee**

The following annual utilisation fee for fixed services shall be applicable:

Utilisation Fee = Basic Fee * Weighting Factor * Range Factor

Table 28 – Fixed Services except Microwave Links, Utilisation Fee

In this formula, the Basic Fee and the Weighting Factor are defined tables 2 &4, the range factor is determined as follows:

Frequency Range	Range Factor
up to 29.7 MHz	0.45
> 29.7 – 470 MHz	1.00
> 470 – 960 MHz	0.90
> 960 MHz – 3 GHz	0.70
> 3 GHz	0.45

Table 29 – Fixed Services except Microwave Links, Range Factor

8.4.2 Microwave Links Service

- **Registration Fee**

The following registration fee for microwave links shall be applicable:

Registration Fee = Number of Locations * Weighting Factor * 4 OMR (for national co-ord.) Registration Fee = Number of Locations * Weighting Factor * 20 OMR (for int. co-ord.)

Table 30 – Microwave Links Service, Registration Fee

In this formula, the Weighting Factor is determined as per Chapter 2.5.2.

- **Utilisation Fee**

The following annual utilisation fee for microwave links shall be applicable:

Utilisation Fee = Basic Fee * Weighting Factor * Number of Locations * Occupancy Factor

Table 31 – Microwave Links Service, Utilisation Fee

In this formula, the Basic Fee and the Weighting Factor are defined as in tables 2&4, the occupancy factor is determined as follows:

Frequency Range	Occupancy Factor
up to 3 GHz	0.75
above 3 GHz up to 10 GHz	0.67
above 10 GHz up to 16 GHz	0.6
above 16 GHz up to 43.5 GHz	0.4
above 43.5 GHz	0.2

Table 32 – Microwave Links Service, Occupancy Factor

8.4.3 Optical Laser Links Service

- **Registration Fee**

The following registration fee for optical laser links shall be applicable:

Registration Fee = OMR 50

Table 33 – Optical Laser Links Service, Registration Fee

- **Utilisation Fee**

The following annual utilisation fee for optical laser links shall be applicable:

Utilisation Fee = OMR 0

Table 34 – Optical Laser Links Service, Utilisation Fee

8.5 Fixed Services – Satellite

8.5.1 VSAT Service – Fixed Terminals

- **Registration Fee**

The following registration fee per VSAT Fixed Terminal shall be applicable:

Registration Fee = OMR 50

Table 35 – VSAT Service – Fixed Terminal, Registration Fee

- **Utilisation Fee**

The following annual utilisation fee for VSAT Fixed Terminal services shall be applicable:

Utilisation Fee: to be summed up according to the table below (per licensee and regardless of number of locations)

Table 36 – VSAT Service – Fixed Terminal, Utilisation Fee

Quantity of Equipment	6/4 GHz OMR	14/11 GHz OMR	Comment
up to 2 terminals	600	400	for each terminal
from 3 to 5 terminals	440	293	for each additional terminal
from 6 to 10 terminals	400	267	for each additional terminal
from 11 to 30 terminals	360	240	for each additional terminal
from 31 to 80 terminals	300	200	for each additional terminal
more than 80 terminals	220	147	for each additional terminal

Table 37 – VSAT Service – Fixed Terminal, Quantity of Equipment Table

8.5.2 Satellite Service – Hub (Fixed Hub, VSAT Hub)

- **Registration Fee**

The following registration fee per hub station shall be applicable:

Registration Fee =	OMR 500

Table 38 – Satellite Service – Hub, Registration Fee

- **Utilisation Fee**

The following annual utilisation fee per hub station shall be applicable:

Utilisation Fee =	OMR 4,500	(per 2 * 1 MHz bandwidth, frequency band 6/4 GHz)
	OMR 3,000	(per 2 * 1 MHz bandwidth, frequency band 14/11 GHz)

Table 39 – Satellite Service – Hub, Utilisation Fee

8.5.3 Feeder Links Service

- **Registration Fee**

The following registration fee per feeder link shall be applicable:

Registration Fee =	50 OMR

Table 40 – Feeder Links Service, Registration Fee

- **Utilisation Fee**

The following annual utilisation fee per feeder link shall be applicable:

Utilisation Fee =	OMR 1,200

Table 41 – Feeder Links Service, Utilisation Fee

8.6 Mobile Services

8.6.1 Aeronautical Mobile Service

8.6.1.1 Aeronautical Mobile Service – Aeronautical Station

- **Registration Fee**

The following registration fee per aeronautical station of the aeronautical mobile service shall be applicable:

Registration Fee =	Weighting Factor * Number of Locations * OMR 4 (OMR 20 for int. co-ord.)

Table 42 – Aeronautical Mobile Service – Aeronautical Station, Registration Fee

In this formula, the Weighting Factor is determined as per tables 3 & 4.

- **Utilisation Fee**

The following annual utilisation fee per aeronautical station of the aeronautical mobile service shall be applicable:

Utilisation Fee =	Basic Fee * Weighting Factor

Table 43 – Aeronautical Mobile Service – Aeronautical Station, Utilisation Fee

8.6.1.2 Aeronautical Mobile Service – Aircraft Station

- **Registration Fee**

The following registration fee per aircraft station of the aeronautical mobile service shall be applicable:

Registration Fee = OMR 50

Table 44 – Aeronautical Mobile Service – Aircraft Station, Registration Fee

- **Utilisation Fee**

The following annual utilisation fee per aircraft station of the aeronautical mobile service shall be applicable:

Mobile Aeronautical Services	Annual Fees (OMR)
Aeroplane with a take-off weight more than 14,000 kg	1,000
Aeroplane with a take-off weight more than 3,200 kg and up to 14,000 kg	500
Aeroplane with a take-off weight of less than 3,200 kg	250

Table 45 – Aeronautical Mobile Service – Aircraft Station, Utilisation Fee

8.6.2 Land Mobile Services

8.6.2.1 GSM Service

- **Registration Fee**

The following registration fee per 2 x 200 kHz channel for GSM services shall be applicable:

Registration Fee = Number of Channels * Coverage Factor * 3,500 OMR

Table 46 – GSM Service, Registration Fee per 2 x 200 kHz

- **Utilisation Fee**

The following annual utilisation fee per 2 x 200 kHz channel for GSM services shall be applicable:

Utilisation Fee = Number of Channels * Coverage Factor * 3,500 OMR

Table 47 – GSM Service, Utilisation Fee per 2 x 200 kHz

Coverage	Coverage Factor
All country	1.00
One Governorate	0.30

Table 48 – GSM, Coverage Factor

8.6.2.2 Mobile Communications onboard Aircraft (MCA) Service

Technical conditions are indicated in Annex H.

- **Registration Fee**

The following registration fee for MCA services shall be applicable:

Registration Fee = 1,000 OMR

Table 49 – MCA Service, Registration Fee

- **Utilisation Fee**

The following annual utilisation fee for MCA services shall be applicable:

Utilisation Fee = 100 OMR

Table 50– MCA Service, Utilisation Fee

8.6.2.3 IMT-2000 Services

- **Registration Fee**

The following registration fee for IMT-2000 services shall be applicable:

Registration Fee =	Number of Channels * Coverage Factor * Technology Factor * 3,500 OMR

Table 51 – IMT-2000 Services, Registration Fee

- **Utilisation Fee**

The following annual utilisation fee for IMT-2000 services shall be applicable:

Utilisation Fee =	Number of Channels * Coverage Factor * Technology Factor * 35,000 OMR

Table 52 – IMT-2000 Services, Utilization Fee

In this formula, the coverage factor and the technology factor are determined as follows:

Coverage	Coverage Factor
All country	1.00
One Governorate	0.30

Table 53 – IMT-2000 Services, Coverage Factor

Technology	Channel	Technology Factor
IMT-2000CDMA Direct Spread	2 x 5 MHz	1
IMT-2000 CDMA TDD	1 x 5 MHz	0.5
IMT-2000CDMA Multi Carrier	2 x 1.25 MHz	0.25
IMT-2000TDMA Single Carrier	2 x 200 kHz	0.1
IMT-2000 TDMA/FDMA	1 x 1728 kHz	0.1
IMT-2000 OFDMA TDD WMAN	1 x 5 MHz	0.5

Table 54 – IMT-2000 Services, Technology Factor

8.6.2.4 PMR Services – Base Station

- **Registration Fee**

The following registration fee for a PMR base station shall be applicable:

Registration Fee = Number of Locations * Weighting Factor * 4 OMR (20 OMR for int. co-ord.)

Table 55 – PMR Services – Base Station, Registration Fee

In this formula, the Weighting Factor is determined as per tables 3 & 4.

- **Utilisation Fee**

The following annual utilisation fee for a PMR base station shall be applicable:

Utilisation Fee = 5.5 * Basic Fee * Weighting Factor * Coverage Zone Factor

Table 56 – PMR Services – Base Station, Utilisation Fee

In this formula table, the Basic Fee and the Weighting Factor are tables 2 & 4, the coverage zone factor is determined as follows:

Population Density	Coverage Zone Factor
High	1.00
Medium	0.70
Low	0.50

Table 57 – PMR Services – Base Station, Coverage Zone Factor

8.6.2.5 PMR Services – Terminals

PMR terminals comprise equipment used stationary as well as non-stationary (e.g. handhelds, equipment in vehicles, motorcycles or ships).

- **Registration Fee**

The following registration fee for PMR terminals shall be applicable:

Registration Fee = OMR 0

Table 58 – PMR Services – Terminals, Registration Fee

- **Utilisation Fee**

The following annual utilisation fee for PMR terminals shall be applicable:

Utilisation Fee = OMR 25

Table 59 – PMR Services – Terminals, Utilisation Fee

In case an applicant does not operate a base station on the same frequency, the first terminal shall be charged like a base station.

8.6.2.6 PMR Services – Allotments

- **Registration Fee**

The following registration fee per allotment for PMR services shall be applicable:

Registration Fee = Number of Channels * 400 (per Governorate)
Registration Fee = Number of Channels * 1,400 (more than 3 Governorates, all country)

Table 60 – PMR Services – Per Governorate/National Allotments, Registration Fees

In this formula, the Number of Channels is determined as per tables 3 & 4.

- **Utilisation Fee**

The following annual utilisation fee per allotment for PMR services shall be applicable:

Utilisation Fee = Number of Channels * 7,500 (per Governorate)
Utilisation Fee = Number of Channels * 25,000 (more than 3 Governorates, all country)

Table 61 – PMR Services – Per Governorate/National Allotments, Utilisation Fees

8.6.2.7 Wireless Broadband Service

- **Registration Fee**

The following registration fee for wireless broadband services shall be applicable (2 * 5 MHz = 1 channel):

Registration Fee = Number of Channels * Coverage Factor * 3,500 OMR

Table 62 – Wireless Broadband Service, Registration Fee

In case of a TDD channel being used (1 * 5 MHz), the registration fee indicated above shall be halved. Fractions of 1 * 5 MHz are treated on a pro-rata basis.

- **Utilisation Fee**

The following annual utilisation fee for fixed wireless broadband services shall be applicable (2 * 5 MHz = 1 channel):

Utilisation Fee = Number of Channels * Coverage Factor * 5,000 OMR

Table 63 – Wireless Broadband Service, Utilisation Fee

In this formula, the coverage factor is determined as follows:

Coverage	Coverage Factor
All country	1.00
One region	0.30
Universal Service Obligations (USO) Area	0.1

Table 64– Wireless Broadband Service, Coverage Factor

In case of a TDD channel being used (1 * 5 MHz), the utilisation fee indicated above shall be halved. Fractions of 1 * 5 MHz are treated on a pro-rata basis.

8.6.3 Maritime Mobile Services

8.6.3.1 Maritime Mobile Service – Coast and Port Stations

- **Registration Fee**

The following registration fee per maritime mobile service coast or port station shall apply:

Registration Fee = Weighting Factor * OMR 4 (OMR 20 for int. co-ord.)

Table 65 – Maritime Mobile Service – Coast or Port Station, Registration Fee

In this formula, the Weighting Factor is determined as per tables 3 & 4.

- **Utilisation Fee**

The following annual utilisation fee per maritime mobile service coast or port station shall apply:

Utilisation Fee = Basic Fee * Weighting Factor

Table 66 – Maritime Mobile Service – Coast or Port Station, Utilisation Fee

8.6.3.2 Maritime Mobile Service – Ship Station

- **Registration Fee**

The following registration fee per maritime mobile service ship station shall be applicable:

Registration Fee = OMR 50

Table 67 – Maritime Mobile Service – Ship Station, Registration Fee

- **Utilisation Fee**

The following annual utilisation fee per maritime mobile service ship station shall be applicable:

Ships and Boats, Type and Size	Utilisation Fee
Commercial Ships and Boats	OMR 500
Leisure Boats more than 10 m	OMR 150
Leisure Boats up to 10 m	OMR 50
Official Boats	OMR 150
Commercial coastal fishing Boats and Ships (Max. Load does not exceed 50 ton & max. Length does not exceed 30 meters)	OMR 100

Table 68 – Maritime Mobile Service – Ship Station, Utilisation Fee

8.6.4 Other Mobile Services

8.6.4.1 Registration Fee

The following registration fee for mobile services not covered elsewhere shall be applicable:

Registration Fee = Weighting Factor * Number of Locations * OMR 4 (OMR 20 for int. co-ord.)

Table 69 – Mobile Services not covered elsewhere, Registration Fee

8.6.4.2 Utilisation Fee

The following annual utilisation fee for mobile services not covered elsewhere shall be applicable:

Utilisation Fee = Basic Fee * Weighting Factor

Table 70 – Mobile Services not covered elsewhere, Utilisation Fee

8.7 Mobile-Satellite Services

8.7.1 Aeronautical Mobile Satellite Service

- **Registration Fee**

The following registration fee for aeronautical mobile satellite services shall be applicable:

Registration Fee = OMR 1,000

Table 71 – Aeronautical Mobile Satellite Service, Registration Fee

- **Utilisation Fee**

The following annual utilisation fee for aeronautical mobile satellite services shall be applicable:

Utilisation Fee = OMR 100

Table 72– Aeronautical Mobile Satellite Service, Utilisation Fee

8.7.2 Land Mobile Satellite Services

8.7.2.1 VSAT Service – Mobile Terminals

- **Registration Fee**

The following registration fee per VSAT Mobile Terminal shall be applicable:

Registration Fee = OMR 500

Table 73 – VSAT Service – Mobile Terminal, Registration Fee

- **Utilisation Fee**

The following annual utilisation fee for VSAT Mobile Terminals shall be applicable:

Quantity of Equipment	6/4 GHz OMR	14/11 GHz OMR	Comment
up to 2 terminals	1,200	800	for each terminal
from 3 to 5 terminals	880	586	for each additional terminal
from 6 to 10 terminals	800	534	for each additional terminal
from 11 to 30 terminals	720	480	for each additional terminal
from 31 to 80 terminals	600	400	for each additional terminal
more than 80 terminals	440	294	for each additional terminal

Table 74 – VSAT Service – Mobile Terminals, Quantity of Equipment Table

8.7.2.2 GMPCS Service

- **Registration Fee**

The following registration fee for GMPCS services shall be applicable:

Registration Fee = OMR 300

Table 75 – GMPCS Service, Registration Fee

- **Utilisation Fee**

The following annual utilisation fee for 2 x 1 MHz bandwidth GMPCS services shall be applicable:

Utilisation Fee = OMR 5,000

Table 76 – GMPCS Service (2 x1 MHz bandwidth), Utilisation Fee

8.7.3 Maritime Mobile Satellite Service

- **Registration Fee**

The following registration fee for maritime mobile satellite services shall be applicable:

Registration Fee = OMR 1,000

Table 77 – Maritime Mobile Satellite Service, Registration Fee

- **Utilisation Fee**

The following annual utilisation fee for maritime mobile satellite services shall be applicable:

Utilisation Fee = OMR 100

Table 78 – Maritime Mobile Satellite Service, Utilisation Fee

8.8 Meteorological Aids Service

- **Registration Fee**

The following registration fee per meteorological aids station shall be applicable:

Registration Fee = Weighting Factor * 4 OMR (20 OMR for int. co-ord.)

Table 79 – Meteorological Aids Service, Registration Fee

- **Utilisation Fee**

The following annual utilisation fee per meteorological aids station shall be applicable:

Utilisation Fee = Basic Fee * Weighting Factor

Table 80 – Meteorological Aids Service, Utilisation Fee

In this formula, the Basic Fee and the Weighting Factor are defined as in tables 2 & 4.

8.9 Radio Astronomy Service

- **Registration Fee**

The following registration fee for radio astronomy services shall be applicable:

Registration Fee = OMR 50

Table 81 – Radio Astronomy Service, Registration Fee

- **Utilisation Fee**

The following annual utilisation fee for radio astronomy services shall be applicable:

Utilisation Fee = OMR 50

Table 82 – Radio Astronomy Service, Utilisation Fee

8.10 Radiodetermination Services

8.10.1 Radionavigation Services

8.10.1.1 Aeronautical Radionavigation Service

- **Registration Fee**

The following registration fee for an aeronautical radionavigation station shall apply:

Registration Fee = Weighting Factor * OMR 4 (20 OMR for int. co-ord.)

Table 83 – Aeronautical Radionavigation Service, Registration Fee

In this formula, the Weighting Factor is determined as per tables 3 & 4.

- **Utilisation Fee**

The following annual utilisation fee for an aeronautical radionavigation station shall apply:

Utilisation Fee = Basic Fee * Weighting Factor * Range Factor

Table 84 – Aeronautical Radionavigation Service, Utilisation Fee

In this formula, the Basic Fee and the Weighting Factor are defined as in tables 2 & 4, the range factor is determined as follows:

Frequency Range	Range Factor
up to 29.7 MHz	0.45
> 29.7 – 470 MHz	1.00
> 470 – 960 MHz	0.90
> 960 MHz – 3 GHz	0.70
> 3 GHz	0.45

Table 85– Aeronautical Radionavigation Service, Range Factor

8.10.1.2 Maritime Radionavigation Service

- **Registration Fee**

The following registration fee per maritime radionavigation station shall apply:

Registration Fee = Weighting Factor * OMR 4 (OMR 20 for int. co-ord.)

Table 86 – Maritime Radionavigation Service, Registration Fee

In this formula, the Weighting Factor is determined as per tables 3 & 4.

- **Utilisation Fee**

The following annual utilisation fee per maritime radionavigation station shall apply:

Utilisation Fee = Basic Fee * Weighting Factor * Range Factor

Table 87 – Maritime Radionavigation Service, Utilisation Fee

Frequency Range	Range Factor
up to 29.7 MHz	0.45
> 29.7 – 470 MHz	1.00
> 470 – 960 MHz	0.90
> 960 MHz – 3 GHz	0.70
> 3 GHz	0.45

Table 88 – Maritime Radionavigation Service, Range Factor

8.10.2 Radiolocation Service

- **Registration Fee**

The following registration fee per radiolocation station shall apply:

Registration Fee = Weighting Factor * OMR 4 * No. Of Locations (OMR 20 for int. co-ord.)

Table 89 – Radiolocation Service, Registration Fee

In this formula, the Weighting Factor is determined as per tables 3 & 4.

- **Utilisation Fee**

The following annual utilisation fee per radiolocation station shall apply:

Utilisation Fee = Basic Fee * Weighting Factor * Range Factor

Table 90 – Radiolocation Service, Utilisation Fee

In this formula, the Basic Fee and the Weighting Factor are defined as in tables 2 & 4, the range factor is determined as follows:

Frequency Range	Range Factor
up to 29.7 MHz	0.45
> 29.7 – 470 MHz	1.00
> 470 – 960 MHz	0.90
> 960 MHz – 3 GHz	0.70
> 3 GHz	0.45

Table 91 – Radiolocation Service, Range Factor

8.11 Radiodetermination Satellite Service

- **Registration Fee**

The following registration fee per feeder link shall be applicable:

Registration Fee = 50 OMR

Table 92 – Radiodetermination Satellite Service, Feeder Link, Registration Fee

- **Utilisation Fee**

The following annual utilisation fee per feeder link shall be applicable:

Utilisation Fee = OMR 1,200

Table 93 – Radiodetermination Satellite Service, Feeder Link, Utilisation Fee

8.12 Space Operation Service

- **Registration Fee**

The following registration fee per feeder link shall be applicable:

Registration Fee = 50 OMR

Table 94 – Space Operation Service, Feeder Link, Registration Fee

- **Utilisation Fee**

The following annual utilisation fee per feeder link shall be applicable:

Utilisation Fee = OMR 1,200

Table 95 – Space Operation Service, Feeder Link, Utilisation Fee

8.13 Standard Frequency and Time Signal Service

- **Registration Fee**

The following registration fee per standard frequency and time signal station shall be applicable:

Registration Fee = Weighting Factor * 20 OMR

Table 96 – Standard Frequency and Time Signal Service, Registration Fee

In this formula, the Weighting Factor is determined as per tables 3 & 4.

- **Utilisation Fee**

The following annual utilisation fee per standard frequency and time signal station shall be applicable:

Utilisation Fee = Basic Fee * Weighting Factor * Range Factor

Table 97 – Standard Frequency and Time Signal Service, Utilisation Fee

In this formula, the Basic Fee and the Weighting Factor are defined as in tables 2 & 4, the range factor is determined as follows:

Frequency Range	Range Factor
up to 29.7 MHz	0.45
> 29.7 – 470 MHz	1.00
> 470 – 960 MHz	0.90
> 960 MHz – 3 GHz	0.70
> 3 GHz	0.45

Table 98 – Standard Frequency and Time Signal Service, Range Factor

8.14 Standard Frequency and Time Signal-Satellite Service

- **Registration Fee**

The following registration fee per standard frequency and time signal-satellite station shall be applicable:

Registration Fee = 50 OMR

Table 99 – Standard Frequency and Time Signal-Satellite Service, Registration Fee

- **Utilisation Fee**

The following annual utilisation fee per standard frequency and time signal-satellite station shall be applicable:

Utilisation Fee = OMR 1,200

Table 100 – Standard Frequency and Time Signal-Satellite Service, Utilisation Fee

Article (9) : The registration and utilisation fees of the following services shall be collected

9.1 Experimental Stations

- **Registration Fee**

The following registration fee for an experimental station shall be applicable:

Registration Fee = OMR 50

Table 101 – Experimental Station, Registration Fee

- **Utilisation Fee**

The following utilisation fee for an experimental station shall be applicable:

Utilisation Fee = pro-rata of the annual charges for the respective service (minimum fee: one month's charge or OMR 50, whichever is higher)

Table 102 – Experimental Station, Utilisation Fee

Spectrum charges for experimental stations shall be calculated on a pro-rata basis of the annual charges in accordance with the relevant service. A minimum period of one month or a minimum fee of OMR 50 shall apply, whichever is higher. The maximum period for the experiment shall be two months.

9.2 Temporary (short-term) Licensing

- **Registration Fee**

A registration fee as specified for the respective service shall apply.

Registration Fee = as specified for the respective service

Table 103 – Temporary (short-term) Licensing, Registration Fee

- **Utilisation Fee**

The following utilisation fee shall be applicable:

Utilisation Fee = pro-rata of the annual charges for the respective service Minimum Fee if: A. Annual fee greater or equal to OMR 50: One month's charge or OMR 50 whichever is higher. B. Annual fee less than OMR 50: Full annual fee.

Table 104 – Temporary (short-term) Licensing, Utilisation Fee

Spectrum charges for temporary licensing shall be calculated on a pro-rata basis of the annual charges in accordance with the relevant radio service.

The maximum period for the temporary authorisation shall be three months.

Renewal of a temporary authorisation is possible once for the same period as the one initially requested. Thereafter, annual fees apply.

9.3 Handling of Standby Equipment

One (1) hot stand-by equipment with identical technical specifications is included in the licence of the operational equipment without extra charge. The same applies for one (1) spare equipment.

- **Registration Fee**

The following registration fee shall be applicable:

Registration Fee = as specified for the respective service

Table 105 – Handling of Standby Equipment, Registration

- **Utilisation Fee**

The following annual utilisation fee shall be applicable:

Utilisation Fee = OMR 0

Table 106 – Handling of Standby Equipment, Utilisation Fee

9.4 Handling of Frequency Diversity

Charging is performed on the same basis as the primary frequency group.

9.5 Data Acquisition Systems in Areas of Low Population Density (Well Heads)

- **Registration Fee**

The following registration fee for data acquisition systems in areas of low population density which consist of a central data collection station and several data acquisition stations shall be applicable:

Registration Fee = Weighting Factor * OMR 4 * No. Of locations (OMR 20 for int. co-ord.)

Table 107 – Data Acquisition Systems in Areas of Low Population Density, Registration Fee

- **Utilisation Fee**

The following annual utilisation fee for data acquisition systems in areas of low population density shall be applicable:

Utilisation Fee = Weighting Factor * Coverage Zone Factor * OMR 33

Table 108 – Data Acquisition Systems in Areas of Low Population Density, Utilisation Fee

9.6 Receive-Only Equipment (non-public Services)

Only receive-only equipment for non-public services shall be subject to licensing.

All equipment for receiving of transmissions intended for the general public (e.g. radio and television, as well as navigational aids like GPS) shall be licence-exempted.

9.6.1 Non-protected Services

- **Registration Fee**

The following registration fee for receive-only equipment (non-protected services) shall be applicable:

Registration Fee = OMR 15

Table 109 – Receive-Only Equipment (non-protected Services), Registration Fee

- **Utilisation Fee**

The following annual utilisation fee for receive-only equipment (non-protected services) shall be applicable:

Utilisation Fee = OMR 0

Table 110 – Receive-Only Equipment (non-protected Services), Utilisation Fee

9.6.2 Protection of Receiving Frequencies requested by the Applicant

- **Registration Fee**

The following registration fee for receive-only equipment, for which a protection of frequencies has been granted by the authority, shall be applicable:

Registration Fee = as per the respective service

Table 111 – Receive-Only Equipment (protected Services), Registration Fee

Utilisation Fee

The following annual utilisation fee for receive-only equipment, for which a protection of frequencies has been granted by the authority, shall be applicable:

Utilisation Fee = 50% of the respective service fee

Table 112 – Receive-Only Equipment (protected Services), Utilisation Fee

9.7 Handling of Space Diversity

50% of applicable fees to the main equipments.

9.8 Other Equipment and Stations not Included in the Regulation

- **Registration Fee**

The following registration fee shall be applicable:

Registration Fee = Weighting Factor * OMR 4 * No. Of Locations	(OMR 20 for int. co-ord.)

Table 113 – Other Equipment and Stations not Included in the Regulation, Registration Fee

In this formula, the Weighting Factor is determined as per tables 3 & 4.

- **Utilisation Fee**

The following annual utilisation fee shall be applicable:

Utilisation Fee = Basic Fee * Weighting Factor

Table 114 – Other Equipment and Stations not Included in the Regulation, Utilisation Fee

In this formula, the Basic fee and Weighting Factor are determined as per tables 2,3 & 4.

Annexes

Annex A:
Population Density

Governorate	Wilayats	Population Density
Muscat Governorate	Muscat	high
Muscat Governorate	Muttarah	high
Muscat Governorate	Al-Amrat	medium
Muscat Governorate	Bawshar	high
Muscat Governorate	As Seeb	high
Muscat Governorate	Qurayat	medium
Dhofar Governorate	Salalah	high
Dhofar Governorate	Taqah	low
Dhofar Governorate	Mirbat	low
Dhofar Governorate	Rakhyut	low
Dhofar Governorate	Thumrait	low
Dhofar Governorate	Dhalkut	low
Dhofar Governorate	Al-Mazyunah	low
Dhofar Governorate	Muqshin	low
Dhofar Governorate	Shalim Wa Juzur Al-Hallaniyat	low
Dhofar Governorate	Sadah	low
Musandam Governorate	Khasab	low
Musandam Governorate	Daba	low
Musandam Governorate	Bukha	low
Musandam Governorate	Madha	low
Al-Buraimi Governorate	Al-Buraimi	medium
Al-Buraimi Governorate	Mhdha	low
Al-Buraimi Governorate	Al-Sunainah	low
Al-Dakhiliyah Governorate	Nizwa	medium
Al-Dakhiliyah Governorate	Bahla	medium
Al-Dakhiliyah Governorate	Manah	low
Al-Dakhiliyah Governorate	Al-Hamra	low
Al-Dakhiliyah Governorate	Adam	low
Al-Dakhiliyah Governorate	Izki	low
Al-Dakhiliyah Governorate	Samail	low
Al-Dakhiliyah Governorate	Bidbid	low

Governorate	Wilayats	Population Density
Al-Batinah North Governorate	Sohar	high
Al-Batinah North Governorate	Shinas	low
Al-Batinah North Governorate	Liwa	low
Al-Batinah North Governorate	Saham	low
Al-Batinah North Governorate	Al-Khabourah	medium
Al-Batinah North Governorate	As Suwaiq	medium
Al-Batinah South Governorate	Ar Rustaq	medium
Al-Batinah South Governorate	Al-Awabi	low
Al-Batinah South Governorate	Nakhal	low
Al-Batinah South Governorate	Wadi Al-Maawil	low
Al-Batinah South Governorate	Barka	medium
Al-Batinah South Governorate	Al-Musanaah	medium
Al-Sharqiyah South Governorate	Sur	medium
Al-Sharqiyah South Governorate	Al-Kamil Wa Al-Wafi	low
Al-Sharqiyah South Governorate	Jaalan Bani Bu Hasan	low
Al-Sharqiyah South Governorate	Jaalan Bani Bu Ali	medium
Al-Sharqiyah South Governorate	Masirah	low
Al-Sharqiyah North Governorate	Ibra	low
Al-Sharqiyah North Governorate	Al-Mudaybi	low
Al-Sharqiyah North Governorate	Bidiyah	low
Al-Sharqiyah North Governorate	Al-Qabil	low
Al-Sharqiyah North Governorate	Wadi Bani Khalid	low
Al-Sharqiyah North Governorate	Dama Wa At Taiyyin	low
Al-Dhahirah Region	Ibri	medium
Al-Dhahirah Governorate	Yanqul	low
Al-Dhahirah Governorate	Dhank	low
Al-Wusta Governorate	Hayma	low
Al-Wusta Governorate	Mahawt	low
Al-Wusta Governorate	Ad Duqm	low
Al-Wusta Governorate	Al-Jazer	low

Table 122 – Population Density Assignment to Wilayats

Annex B:

Governorates

Governorates and Regions
Muscat Governorate
Dhofar Governorate
Musandam Governorate
Al-Buraimi Governorate
Al-Dakhiliyah Governorate
Al-Batinah North Governorate
Al-Batinah South Governorate
Al-Sharqiyah North Governorate
Al-Sharqiyah South Governorate
Al-Dhahirah Governorate
Al-Wusta Governorate

Table 123 – Governorates of the Sultanate of Oman

Annex C:

Fee and License-exempted Radio Services and Equipment

- Use of GSM, UMTS, GMPCS and DECT terminals and pagers;
- Point-to-Multipoint and Multipoint-to-Multipoint Telecommunication Terminals;
- Short Range Devices (defined in Annex D);
- Short range radars (defined in Annex E);
- Receive-only equipment (public services) as defined in Article (9) Provision (9.6) of this regulation;
- Radio equipment designed for safety services including equipment designed for persons with special needs and for safety of patients for which the Authority shall approve the bands and type of equipment and attached in annex K of this regulation.
- WAS/RLANs (defined in Annex F) after meeting the conditions, specifications and standards listed in Annex F. Users of these systems shall avoid harmful interference with other users and shall not be entitled to protection from this interference.
    - If these systems are used for the provision of telecommunications services to others or are installed in public places proper licensing in accordance with the Telecommunications Regulatory Act is required.
    - As an exception, use of systems operating in the bands indicated in this clause that do not meet the technical conditions and specifications listed in annex F is authorised until 2012. For these systems, fees according to Chapter 8.4.1 shall apply.
- PMR 446 that are not reprogrammable operating in the bands 446 – 446.2 MHz (defined in Annex J) after meeting the conditions, specifications and standards listed in Annex J. Users of these systems shall avoid harmful interference with other users and shall not be entitled to protection from this interference.

Annex D:

Short Range Devices, Frequency Ranges and Power Limitations

SRDs may be fixed, mobile or portable stations which have a radio frequency output connector and dedicated antenna or an integral antenna. Applications include telecommand, alarms, data communication, detection of avalanche victims, meter reading, asset tracking, hearing aids, movement detection and alert, remote controls, inductive systems, and many other applications. These devices may employ different types of modulation and may have speech application.

- **SRDs shall be designed to meet the following basic objectives:**

- The device is intended to operate in unprotected and shared frequency bands. Its operation shall not cause interference with other authorized radio-communication services, and be able to tolerate any interference caused by other radio-communication services, electrical or electronic equipment.
- The device shall not be constructed with any external or readily accessible control which permits the adjustment of its operation in a manner that is inconsistent with these Requirements.
- The device shall be marked with the supplier/manufacturer's name or identification mark, and the supplier/manufacturer's model or type reference. The markings shall be legible, indelible and readily visible.

- **Regulatory Requirements**

- All SRDs that are intended to be manufactured and/or imported shall be type approved by the Telecommunications Regulatory Authority (TRA) of the Sultanate of Oman before they are placed on the Omani market.
- The operation of SRDs that meet these requirements and are appropriately type approved are exempted from individual licensing if other conditions are not stated hereinafter.
- Local companies selling, manufacturing and/or importing SRDs are requested to register with TRA as dealers of telecommunications equipment.

- **Technical Requirements**

- The SRD shall comply with the maximum field strength or output power given in Table 124, operating in its intended frequency band or frequencies. It shall fulfil the relevant requirements of this specification on all the permitted frequencies which it is intended to operate.

- **Type-approval Requirements**

  Along with application for type approval, the applicant shall present the documents that provide the full technical specifications of the equipment and the documents that prove its conformity to the technical standards adopted (or required) in the Sultanate like ETSI and IEC standards or alternative national standards. These documents shall be obtained from accredited bodies and may include, but not limited to:

- EMC, Safety and RF conformity test reports
- Manufacturer's Declaration of Conformity
- Certificates of Conformity.

Further details regarding frequency ranges, radiated power and typical applications are provided in the table below.

Authorized Frequency bands / Frequencies		Power / Magnetic Field	Channel Spacing	Duty Cycle (%)	Examples of SRD Applications	Remarks
1	13.553-13.567 MHz	42 dBµA/m at 10m	no channel spacing – the whole stated frequency band may be used	no duty cycle restriction	Non-specific Short Range Devices[1] (Telemetry, Telecommand, Alarms and Data in general and other similar applications)	
1.1	26.957-27.283 MHz	42 dBµA/m at 10 metres or 10 mW ERP				
2	40.660-40.700 MHz	10 mW ERP				
3	433.050-434.790 MHz (note 4)	10 mW ERP		below 10 %		Applications providing audio should be excluded. See Note 4bis for voice applications
4	433.050-434.790 MHz (note 4bis)	1 mW ERP -13 dBm/10 kHz for wide band channels[2]		no duty cycle restriction		
5	434.040-434.790 MHz (note 4bis)	10 mW ERP	up to 25 kHz			
6	868.0 – 868.6 MHz (note 4)	25 mW ERP	no spacing, for 1 or more channels (note 2)	below 1 % or LBT (note 1)		Narrow/ wide-band modulation No channel spacing, however the whole stated frequency band may be used
7	868.7-869.2 MHz (note 4)	25 mW ERP		below 0.1 % or LBT (note 1)		
8	869.4-869.65 MHz (note 4)	500 mW ERP	25 kHz[3] (for one or more channels)	below 10 % or LBT (note 1)		Narrow/ wide-band modulation The whole stated frequency band may be used as 1 channel for high speed data transmission
9	869.7-870 MHz (note 4bis)	5 mW ERP	no channel spacing, for 1 or more channels)			Narrow/ wide-band modulation No channel spacing, however the whole stated frequency band may be used
9.2	863-870 MHz (note 3, 4 and 6)	25 mW ERP	≤100 kHz for 47 or more channels (note 2)	below 0.1 % or LBT (note 1 and 5)		FHSS modulation
		25mW ERP (note6) Power density: -4.5 dBm/100 kHz (note 8)		below 0.1 % or LBT (note 1, 5 and 6)		DSSS and other wideband modulation other than FHSS
		25 mW ERP	≤100 kHz, for 1 or more channels (note 2 and 7)	below 0.1 % or LBT (note 1 and 5)		Narrow/ wide-band modulation
9.3	2400-2483.5 MHz	10 mW ERP				
9.4	5725-5875 MHz	25 mW ERP				

1 Video applications should only be used above 2.4 GHz.
2 For the purpose of this Technical Specification wideband channels are those with a bandwidth greater than 250 kHz.
3 The center frequency of the first channel is at a distance of channel spacing/2 from the lower frequency band edge.

Authorized Frequency bands / Frequencies		Power / Magnetic Field	Channel Spacing	Duty Cycle (%)	Examples of SRD Applications	Remarks
10	457 kHz	7 dBµA/m at 10 m	continuous wave (CW) – no modulation	no duty cycle restriction	Detection of avalanche victims	
11	169.4-169.475 MHz	500 mW ERP	12.5 kHz, 25 kHz, Max 50 kHz	below 10 %	Meter reading	
				below 1 %	Asset Tracking and Tracing Systems	
12	169.4875-169.5875 MHz	10 mW ERP	12.5 kHz, 25 kHz, max 50 kHz	no duty cycle restriction	Aids for hearing impairment	
13	2400-2483.5 MHz	25 mW EIRP	no channel spacing – the whole stated frequency band may be used.	No duty cycle restriction	Movement Detection and Alert	
14	169.481250 MHz, 169.593750 MHz	10 mW ERP	12.5 kHz	below 1 %	Alarm systems, social alarms, alarms for security and safety	
15	868.6-868.7MHz		25 kHz[4] or the whole frequency band may also be used as one channel for high speed data transmission	below 0.1 %		
16	869.250-869.3MHz		25 kHz[4]			
17	869.650-869.7MHz	25 mW ERP		below 10 %		
17.2	869.2-869.25MHz	10 mW ERP		below 0.1 %		Social alarms
17.3	869.3-869.4MHz			below 1 %		
18	26.995, 27.045, 27.095, 27.145, 27.195 MHz	100 mW ERP	10 kHz[4]	no duty cycle restriction	Model control	
19	34.995-35.225 MHz					only for flying models
20	40.665, 40.675, 40.685, 40.695MHz					
21	9 – 59.750 kHz	72 dBµA/m at 10 metres[5] (at 30 kHz descending 3 dB/oct)	No channel spacing – whole stated frequency band may be used	no duty cycle restriction	Inductive applications	in case of external antennas only loop coil antennas shall be employed
22	59.750 – 60.250 kHz	42 dBµA/m at 10 metres				
23	60.250 – 70 kHz	72 dBµA/m at 10 metres[5] (at 30 kHz descending 3 dB/oct)				
24	70 – 119 kHz	42 dBµA/m at 10 metres				
25	119 – 135 kHz	72 dBµA/m at 10 metres[5] (at 30 kHz descending 3 dB/oct)				
26	7400 – 8800 kHz	9 dBµA/m at 10 metres				
27	26.957 – 27.283 MHz	42 dBµA/m at 10 metres				
27.2	10.2-11 MHz	9 dBµA/m at 10 metres				

4 The center frequency of the first channel is at a distance of channel spacing/2 from the lower frequency band edge.

5 In the case of loop antennas (integral or dedicated) with an area between 0.05 m^2 and 0.16 m^2, field strength is reduced by 10 * log (area/0.16 m^2); for an antenna area less than 0.05 m^2 field strength is reduced by 10 dB.

Authorized Frequency bands / Frequencies		Power / Magnetic Field	Channel Spacing	Duty Cycle (%)	Examples of SRD Applications	Remarks
28	402-405 MHz	25 µW ERP	25 kHz[6] or individual transmitters may combine adjacent channels for an increased bandwidth of up to 300 kHz	no duty cycle restriction	Medical Implants	
29	863 – 865 MHz	10 mW e.r.p.	No channel spacing – whole stated frequency band may be used[7]	no duty cycle restriction	Wireless Audio Applications	There shall be no transmission of an RF carrier in the absence of an audio input
29.2	87.5-108 MHz (note 11)	50 nW ERP	200 kHz			
29.3	470-790 (note 13)	50 mW e.r.p.	No spacing	No requirement		Radio microphones and Assistive Listening Devices
30	865-868 MHz	20 µW ERP (note 9)	200 kHz	LBT, max. Period of continuous transmission on channel is 4 s	Radio Frequency Identification (RFID) Applications (e.g. automatic article identification, asset tracking, alarms systems, waste management, personal identification, access control, proximity sensors, anti-theft systems, location systems, data transfer to handheld devices and wireless control systems etc.)	RFID tags may respond on any channel within the band Interrogators are not required to use LBT in the 4 high power channels
30.1	13.553-13.567 MHz	42 dBµA/m at 10m	No spacing	No requirement		For inductive applications
30.2	13.553-13.567 MHz	60 dBµA/m at 10m	No spacing	No requirement		For RFID and EAS only
31	2446-2454 MHz (note 10)	≤500 mW EIRP >(500 mW-4 W) EIRP	No spacing	No requirement ≤15% duty cycle		Power levels above 500 mW are restricted to use inside the boundaries of a building and the duty cycle of all transmissions shall in this case be ≤15% in any 200 ms period (30 ms on /170 ms off)
32	77-81 GHz	Note 12	Note 12		Road Transport and Traffic Telematics (RTTT)	Short range radar (SRR)

Table 124 – SRD, Frequency Ranges, Radiated Power and Typical Applications

6 The center frequency of the first channel is at a distance of channel spacing/2 from the lower frequency band edge.
7 In the case of analogue systems the maximum occupied bandwidth shall not exceed 300 kHz.

Note1: For frequency agile devices the duty cycle limit applies to the total transmission unless LBT is used. For LBT devices without frequency agility, the duty cycle limit applies.

Note 2: The preferred channel spacing is 100 kHz allowing for a subdivision into 50 kHz or 25 kHz

Note 4: The duty cycle, LBT or equivalent technique shall not be user dependent and shall therefore be guaranteed by appropriate technical means

Note 4bis: Audio applications should be excluded. Voice applications allowed with spectrum access technique such as LBT or equivalent technique, the transmitter shall include a power output sensor controlling the transmitter to a maximum transmit period of 1 minute.

Note 5: Duty cycle may be increased to 1% if the band is limited to 865-868 MHz

Note 6: For other wide-band modulation than FHSS and DSSS with a bandwidth of 200 kHz to 3 MHz, duty cycle can be increased to 1% if the band is limited to 865-868 MHz and power to ≤10 mWe.r.p.

Note 8: The power density can be increased to +6.2 dBm/100 kHz and +0.8 dBm/100 kHz, if the band of operation is limited to 865-868 MHz and 865-870 MHz respectively.

Note 9: Maximum radiated power is 2 W ERP in four high power channels (4, 7, 10 and 13). Channel centre frequencies are 864.9 MHz+(0.2 MHz * channel number)

Note 10: Frequency Hopping Spread Spectrum (FHSS) techniques should be used as means of mitigation when more than 500 mW EIRP is used

Note 11: Systems should be designed so that when not in use there should be no transmission of an RF carrier. When audio signals are not present, apparatus must employ a transmission time out facility. Pilot tones that ensure continuity of transmission are not permitted. The user interface of SRD shall permit as a minimum the selection of any and all possible frequencies within the 88.1 MHz to 107.9 MHz and as a maximum 87.6 MHz to 107.9 MHz.

Note 12: Maximum mean power density of -3 dBm/MHz e.i.r.p. associated with a peak limit of 55 dBm EIRP. Maximum mean power density outside a vehicle resulting from the operation of one SRR equipment shall not exceed -9 dBm/MHz EIRP.

Note 13: The band 790-862 MHz may also be used for Wireless Radio Microphones and Assistive Listening Devices till 17 June 2015 with the same characteristics and conditions as for the band 470-790 MHz.

Annex E:

Technical Specifications of Short Range Radar (SRR)

An SRR is defined as a radiocommunication equipment that falls in the general category of vehicular radar systems and provides collision mitigation and traffic safety applications;

Technical Specifications	Short Range Radar (SRR)
Frequency Band:	21.65-26.65 GHz
EIRP max.:	-41.3 dBm/MHz maximum mean power density 0 dBm/50MHz peak power density
References:	ETSI EN 302 288-1 and ETSI EN 302 288-2

Table 125 – Short Range Radar, Ultra Wideband Component, Technical Specifications

Technical Specifications	Short Range Radar (SRR)
Frequency Band:	24.05-24.25 GHz
EIRP max.:	20 dBm maximum peak power
Duty Cycle:	10% for peak emissions higher than -10 dBm EIRP
References:	ETSI EN 302 288-1 and ETSI EN 302 288-2

Table 126 – Short Range Radar, Narrowband Component, Technical Specifications

Operation of SRR equipment is on a non-interference and non-protected basis;

Emissions within the 23.6-24 GHz band that appear 30° or greater above the horizontal plane shall be attenuated by at least 25 dB up to 2010 and 30 dB up to 1 July 2013 for above SRR systems;

24 GHz frequency range may only be used in Oman for new SRR systems until the reference date that is set to 1 July 2013. After this reference date, the 79 GHz range for new SRR systems or alternative permitted technical solutions must be used for road vehicle collision mitigation and traffic safety applications, while existing 24 GHz equipment may still operate to the end of the lifetime of the vehicles;

Any type of SRR equipment shall be type approved by the TRA.

Annex F:

Technical Specifications for Wideband and Broadband Data Transmission Systems

Frequency Band	Allowed Power	Type of allowed Applications	Restric-tions	Mandatory Mitigation Techniques	Additional Requirements
2400-2483.5 MHz	100 mW max. mean EIRP For wide band and broadband modulations other than frequency hopping spread spectrum, the maximum spectrum power density is limited to 10mW/MHz	RLANs	Indoor use only		Integral (no external antenna socket) or dedicated antenna only
5150-5250 MHz	200 mW max. mean EIRP 10 mW/MHz max. mean EIRP density	WAS/RLANs	Indoor use only		
5250-5350 MHz	200 mW max. mean EIRP 10 mW/MHz max. mean EIRP density	WAS/RLANs	Indoor use only	TPC[1] DFS[2]	
5470-5725 MHz	1 W max. mean EIRP 50 mW/MHz max. mean EIRP density	WAS/RLANs		TPC[1] DFS[2]	
5725-5850 MHz	2 W max. mean EIRP 20 dBm/MHz max. mean EIRP density	FWA systems only	Outdoor use only	TPC[3] DFS[4]	Elevation plane antenna patterns of FWA central and terminal stations shall meet appropriate envelop patterns derived from Recommendation ITU-R F.1336-1

1. WAS/RLANs operating in the bands 5250-5350 MHz and 5470-5725 MHz shall either employ transmitter power control (TPC), or, if TPC is not used, then the maximum permitted mean EIRP and the corresponding mean EIRP density limits shall be reduced by 3 dB;
2. WAS/RLANs operating in the bands 5250-5350 MHz and 5470-5725 MHz shall use mitigation techniques complying with the detection, operational and response requirements described in Annex 1 of Recommendation ITU-R M.1652 to ensure compatible operation with the radiodetermination system;
3. FWA systems operating in frequency band 5725-5850 MHz shall employ TPC with a range of at least 5 dB;
4. FWA systems operating in frequency band 5725-5850 MHz shall employ DFS mechanisms with equivalent DFS detection threshold (dBm) at receiver input shall be as following:

   DFS(dBm)=-69+23-(Max.Tx EIRP(dBm)) -10lgChS(MHz)+Grx(dBi), where ChS is nominal operating channel width and Grx is receiver antenna gain.

Table 127 – WAS/RLANs, Technical Specifications.

Annex G:

Technical Specifications of Mobile Communications Onboard Aircraft (MCA)

1. Mobile Communications onboard Aircraft (MCA) shall fulfil the requirements of Decision Amended ECC/DEC(06)07 of the Electronic Communications Committee (ECC) amended on 13th March 2009, particularly the following:

   - The absolute minimum height above ground for any transmission from the system in operation shall be 3,000 metres;
   - Total EIRP defined outside the aircraft resulting from the base station (BTS) within the aircraft shall not exceed -13 dBm/channel at 3,000 m;
   - EIRP defined outside the aircraft, resulting from the GSM mobile terminal transmitting at 0 dBm shall not exceed 1.8 dBm/channel at 3,000 m;
   - The aircraft-BTS shall control the transmit power of all GSM mobile terminals, transmitting in the GSM 1800 band, to the minimum nominal value of 0 dBm at all stages of communication, including initial access;

   Corresponding MCA licenses issued by foreign authorities for aircraft registered outside of the Sultanate of Oman will be recognised in the Sultanate.

2. The companies licensed shall comply with the following:

   a. The equipment installed in aeroplanes must not cause harmful interferences to the terrestrial services, particularly the Public Mobile Telecommunications Services.

   b. To meet requirements of national security by enabling the competent authorities to obtain all the information and data upon requesting traffic of calls and communications that take place within the Omani airspace when crossed by aeroplanes.

   c. Not to use the equipment installed in aeroplanes except above the altitude of 3000 meters above the earth's surface, and to switch them off upon landing.

Annex H:
Cross-Reference Index

Code	Name of the Radio Communication Service	Class of Station Code	Name of the Class of Station	Systems/ Technologies	Systems Examples	Fee as per Chapter
B	Broadcasting	BC	Broadcasting station, sound	AM sound analogue; DRM; FM sound analogue; T-DAB	MW, SW, FM, DRM, T-DAB, DMB	8.1.1, SW: 8.1.2
		BT	Broadcasting station, television	TV analogue; DVB-T; DVB-H	ATV, DVB-T, DVB-H	8.1.1
D	Radio Determination	Not defined	Radio determination station, i.e. station in the radio determination service	Short range radars (sensors)		Article (5) of the Regulation
		Not defined	Radio Direction-Finding station, i.e. radio determination station using radio direction-finding			Direction Finding Receivers: 9.6
						Beacon Stations for Radio Direction Finding: 8.4.1
		Not defined	Primary Radar, i.e. radio determination system based on the comparison of reference signals with radio signals reflected from the position to be determined	Primary radar		8.10.1.1, 8.10.1.2
		Not defined	Secondary Radar, i.e. radio determination system based on the comparison of reference signals with radio signals retransmitted from the position to be determined	SSR		Fixed Station: 8.6.1.2
						Transponder Station: 8.6.1.2
		Not defined	Radar Beacon (racon), i.e. transmitter-receiver 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	IFF;		Article 2 of the Decision
DL	Radiolocation	LR	Radiolocation land station, i.e. station in the radiolocation service not intended to be used while in motion	ADS; ADSE; Weather radar; Wind profilers;		8.10.2
				Air-defence radar; Tactical radar;		Article 2 of the Decision
				Radiolocation (civil)		8.10.2

Code	Name of the Radio Communication Service	Class of Station Code	Name of the Class of Station	Systems/ Technologies	Systems Examples	Fee as per Chapter
		MR	Radiolocation mobile station, i.e. station in the radiolocation service intended to be used while in motion or during halts at unspecified points			Aircraft Station 8.6.1.2 Ship Station 8.6.3.2
DN	Radionavigation	NR	Radio navigation mobile station, i.e. station in the radio navigation service intended to be used while in motion or during halts at unspecified points	D-GPS; Land radio navigation		Article (5) of the Regulation
		RN	Radio navigation land station, i.e. station in the radio navigation service not intended to be used while in motion	RSBN; TACAN-DME;		Article 2 of the Decision
				D-GPS		8.10.2
		Not defined	Radio beacon station, i.e. station in the radio navigation service the emissions of which are intended to enable a mobile station to determine its bearing or direction in relation to the radio beacon station	Beacons (tactical)		Article 2 of the Decision
DNA	Aeronautical radionavigation	AL	Land station in the aeronautical radio navigation service	ILS; MLS; VOR; Loran C;		8.10.1.1
		AM	Mobile station in the aeronautical radio navigation service	Airborne weather radar; Airborne doppler navigation aids; ILS; MLS; VOR; Loran C	All onboard systems	8.6.1.2
		Not defined	Marker beacon, i.e. transmitter in the aeronautical radionavigation service which radiates vertically a distinctive pattern for providing position information to aircraft	Beacons (aeronautical);		8.10.1.1
		Not defined	Aircraft radio altimeter, used to determine the height of the aircraft above the Earth's surface	Altimeters; ASDE; DME;		8.6.1.2
DNM	Maritime radio navigation	NL	Maritime radio navigation land station	Maritime navigation (maritime beacons, Inland waterway radar, Loran C, Maritime radar, SAR (navigation))		8.10.1.2
		RM	Maritime radionavigation mobile station	EPIRBs; Maritime navigation (maritime beacons, Inland waterway radar, Loran C, Maritime radar, SAR (navigation))		8.6.3.2

Code	Name of the Radio Communication Service	Class of Station Code	Name of the Class of Station	Systems/ Technologies	Systems Examples	Fee as per Chapter
F	Fixed	FX	Fixed station, i.e. station in the fixed service	MWS; Scanning telemetry; Subscriber access excluding MWS; Unplanned, uncoordinated fixed links; SAP/SAB P2P audio links; SAP/SAB P2P video links; Different mesh systems;	P2P links incl. microwave P2MP including FWA systems	8.4.2
				Private fixed networks;		8.4.1
				Public fixed networks; MultiPoint-to-MultiPoint Fixed links;		8.6.2.7
				Fixed radio relay (military); Tactical radio relay		Article 2 of the Decision
H	Standard frequency and time signal	SS	Standard frequency and time signal station	Standard frequency and time signal		Transmitting Station: 8.13 Receive-only: Article (5) of the Regulation
M	Mobile	FL	Land station, i.e. station in the mobile service not intended to be used while in motion	Professional cordless cameras; Professional radio microphones; SAP/SAB airborne video links; SAP/SAB engineering links; SAP/SAB remote control; SAP/SAB P to P audio links; SAP/SAB P to P video links; Talkback;		8.6.4
				JTIDS/MIDS; Tactical mobile;		Article 2 of the Decision
				HAPS		8.4.1
		MO	Mobile station, i.e. station in the mobile service intended to be used while in motion or during halts at unspecified points	Professional cordless cameras; Professional radio microphones; SAP/SAB airborne video links; SAP/SAB engineering links; SAP/SAB remote control; SAP/SAB P to P audio links; SAP/SAB P to P video links; Talkback;		8.6.4
				JTIDS/MIDS; Tactical mobile;		Article 2 of the Decision

Code	Name of the Radio Communication Service	Class of Station Code	Name of the Class of Station	Systems/ Technologies	Systems Examples	Fee as per Chapter
		Not defined	Emergency position-indicating radio beacon (EPIRB) station, i.e. station in the mobile service the emissions of which are intended to facilitate search and rescue operations	MSI EPIRBs		Article (5) of the Regulation
MT	Land mobile	FB	Base station, i.e. land station in the land mobile service	DVB-H		8.1.1
				SAP/SAB vehicular audio links; SAP/SAB vehicular video links		8.6.4
				Digital cellular (ex. GSM, GPRS, EDGE, CDMA, UMTS etc)	PAMR (incl. GSM, UMTS)	8.6.2.1, 8.6.2.3 Base Station: 8.6.2.4 Allotments: 8.6.2.6 MCA: 8.6.2.2
				Cordless telephones		Article (5) of the Regulation
				Emergency services;	Others	Article (5) of the Regulation
				Inland waterway communications; Paging; SAP/SAB and ENG/OB (all categories)		8.6.2.4
		ML	Land mobile station, i.e. mobile station in the land mobile service	DVB-H		8.1.1
				SAP/SAB vehicular audio links; SAP/SAB vehicular video links;		8.6.4 8.6.4
				Digital cellular (ex. GSM, GPRS, EDGE, CDMA, UMTS etc)	PAMR (incl. GSM, UMTS)	8.6.2.1, 8.6.2.3
				Cordless telephones		Article (5) of the Regulation
				Emergency services;		Article (5) of the Regulation
				Inland waterway communications; Paging; PMR/PAMR;		8.6.2.5
					PMR	
				SAP/SAB and ENG/OB (all categories)	Others	8.6.4

Code	Name of the Radio Communication Service	Class of Station Code	Name of the Class of Station	Systems/ Technologies	Systems Examples	Fee as per Chapter
MM	Maritime mobile	FC	Coast station, i.e. land station in the maritime mobile service	GMDSS; DSC; NAVTEX; Maritime communications (AIS, Inland waterway communications, INMARSAT, Port operations, On-board communications, Ship movement)		8.6.3.1
		FP	Port station, i.e. coast station in the port operations service, part of the maritime mobile service	GMDSS; DSC; NAVTEX; Maritime comunications (AIS, Inland waterway commnications, INMARSAT, Port operations, On-board communiations, Ship movement)		8.6.3.1
		MS	Ship station, i.e. mobile station in the maritime mobile service	GMDSS;		8.6.3.2
				DSC;		n/a
				NAVTEX;		Article (5) of the Regulation
				Maritime communications (AIS, Inland waterway communications, INMARSAT, Port operations, On-board communications, Ship movement)		8.6.3.2
		Not defined	On-board communication station, i.e. mobile station in the maritime mobile service			8.6.3.2
MA	Aeronautical mobile	FA	Aeronautical station, i.e. land station in the aeronautical mobile service	AGA communications (civil);		8.6.1.1
				AGA communications (military)		Article 2 of the Decision
		MA	Aircraft station, i.e. mobile station in the aeronautical mobile service	AGA communications (civil);	All onboard system	Mobile Station: 8.6.1.2
				AGA communications (military)		Article 2 of the Decision
MAR	Aeronautical mobile (R)	FD	Aeronautical station in the aeronautical mobile (R) service	AGA communications (civil)	All onboard systems	Aircraft Station: 8.6.1.2
MAO	Aeronautical mobile (OR)	FG	Aeronautical station in the aeronautical mobile (OR) service	AGA communications (civil);	All onboard systems	Aircraft Station: 8.6.1.2
				AGA communications (military)		Article 2 of the Decision
MX	Mobile except aeronautical mobile					
MXO	Mobile except aeronautical mobile (OR)					

Code	Name of the Radio Communication Service	Class of Station Code	Name of the Class of Station	Systems/ Technologies	Systems Examples	Fee as per Chapter
MXR	Mobile except aeronautical mobile (R)					
W	Meteorological aids	OD	Oceanographic data station			8.8
		OE	Oceanographic data interrogation station			8.8
		SA	Mobile station in the meteorological aids service. For example: Radio sonde, i.e. automatic radio transmitter usually carried on an aircraft, free balloon, kite or parachute, and which transmits meteorological data	Sondes;		8.8
				Meteorological aids (military)		Article 2 of the Decision
		SM	Meteorological aids base station	Meteorological aids (military)		Article 2 of the Decision
Z	Amateur	AT	Amateur station	Amateur		Not per station but per person.
				CB radio		8.6.2.5
		PL	Combination of two or more classes of station (limited to collective entries made under the terms of RR No. 20.5)			n/a
SA	Radio astronomy	RA	Radio astronomy station	Continuum measurements; Spectral line observations; VLBI observations		8.9
SB	Broadcasting-satellite	EB	Space station in the broadcasting-satellite service (sound broadcasting)			n/a
		EV	Space station in the broadcasting-satellite service (television)			n/a
		UB	Earth station in the broadcasting-satellite service (sound broadcasting)	Satellite radio; SIT/SUT; Broadcasting-satellite (receivers); Feeder links		8.2.1
		UV	Earth station in the broadcasting-satellite service (television)	Satellite TV; SIT/SUT; Broadcasting-satellite (receivers); Feeder links		8.2.1
SD	Radio determination satellite	EF	Space station in the radio determination-satellite service			n/a
		TF	Fixed earth station in the radio determination-satellite service	Feeder links		8.11
		TL	Mobile earth station in the radio determination-satellite service			8.11

Code	Name of the Radio Communication Service	Class of Station Code	Name of the Class of Station	Systems/ Technologies	Systems Examples	Fee as per Chapter
SDL	Radiolocation-satellite					Receiver Article (5) of the Regulation Transmitter n/a
SDN	Radionavigation-satellite	EN	Space station in the radionavigation-satellite service			n/a
		TN	Fixed earth station in the radionavigation-satellite service	Feeder links		8.5.3
		UN**	Mobile earth station in the radionavigation-satellite service	Satellite navigation systems (GPS, Glonass, Galileo)		Receiver Article (5) of the Regulation Transmitter 8.5.3
				GPS; Glonass;;		Article 2 of the Decision
SDNA	Aeronautical radionavigation-satellite	EO	Space station in the aeronautical radio-navigation-satellite service			n/a
		TO	Mobile earth station in the aeronautical radionavigation-satellite service	Satellite navigation systems (GPS, Glonass, Galileo);		Receive-only: Article (5) of the Regulation Transmitter: 8.6.4
				GPS; Glonass;		Article 2 of the Decision
		TZ	Fixed earth station in the aeronautical radionavigation-satellite service	Feeder links		8.5.3
SDNM	Maritime radionavigation-satellite	EQ	Space station in the maritime radionavigation-satellite service			n/a
		TQ	Mobile earth station in the maritime radionavigation-satellite service	Satellite navigation systems (GPS, Glonass, Galileo);		Article (5) of the Regulation Transmitter: 8.6.4
				GPS; Glonass;		Article 2 of the Decision
		TX	Fixed earth station in the maritime radionavigation-satellite service	Feeder links		8.5.3
SF	Fixed-satellite	EC	Space station in the fixed-satellite service			n/a

Code	Name of the Radio Communication Service	Class of Station Code	Name of the Class of Station	Systems/ Technologies	Systems Examples	Fee as per Chapter
		TB	Aeronautical earth station, providing a feeder link for the aeronautical mobile-satellite service	Feeder links	HUBs	8.5.3
		TC	Earth station in the fixed-satellite service	Feeder links; FSS Earth stations (VSAT, SIT/SUT, SNG, ESV);	HUBs	8.5.2
					VSAT, SIT/SUT, SNG, ESV	8.5.1
		TI	Coast earth station, providing a feeder link for the maritime mobile-satellite service	Feeder links	HUBs	8.5.2
		TY	Base earth station, providing a feeder link for the land mobile-satellite service	Feeder links	HUBs	8.5.2
		VA	Land earth station, providing a feeder link for the mobile-satellite service	Feeder links	HUBs	8.5.2
SH	Standard frequency and time signal-satellite	EE	Space station in the standard frequency-satellite service			n/a
		EY	Space station in the time signal-satellite service			n/a
		UE	Earth station in the standard frequency-satellite service	Standard frequency and time signal-satellite		8.14
		UY	Earth station in the time signal-satellite service	Standard frequency and time signal-satellite		8.14
SI	Inter-satellite	ES	Space station in the inter-satellite service			n/a
SM	Mobile-satellite	EI	Space station in the mobile-satellite service			n/a
		TE	Mobile earth station; i.e. earth station in the mobile-satellite service the emissions of which are intended to facilitate search and rescue operations (Satellite EPIRB)	SAR		Article (5) of the Regulation
		UA	Mobile earth station, i.e. earth station in the mobile-satellite service intended to be used while in motion or during halts at unspecified points	Aeronautical satcoms (INMARSAT); MSS Earth stations (INMARSAT, 3G satcomponent, GMPCS);	GMPCS	8.7.2.2
				Satellite communications (military)		Article 2 of the Decision
SMT	Land mobile-satellite	EU	Space station in the land mobile-satellite service			n/a
		TU	Land mobile earth station, i.e. mobile earth station in the land mobile-satellite service	Aeronautical satcoms (INMARSAT); MSS Earth stations (INMARSAT, 3G satcomponent, GMPCS);	GMPCS	8.7.2.2 8.7.2.1
				Satellite communications (military)		Article 2 of the Decision
SMM	Maritime mobile-satellite	EG	Space station in the maritime mobile-satellite service			n/a

Code	Name of the Radio Communication Service	Class of Station Code	Name of the Class of Station	Systems/ Technologies	Systems Examples	Fee as per Chapter
		TG	Ship earth station, i.e. mobile earth station in the maritime mobile-satellite service	Aeronautical satcoms (INMARSAT); MSS Earth stations (INMARSAT, 3G satcomponent, GMPCS);		8.7.3
				Satellite communications (military)		Article 2 of the Decision
SMA	Aeronautical mobile-satellite	EJ	Space station in the aeronautical mobile-satellite service			n/a
		TJ	Aircraft earth station, i.e. mobile earth station (aircraft) in the aeronautical mobile-satellite service	Aeronautical satcoms (INMARSAT); MSS Earth stations (INMARSAT, 3G satcomponent, GMPCS);		8.7.1
				Satellite communications (military)		Article 2 of the Decision
SMAR	Aeronautical mobile-satellite (R)					n/a
SMAO	Aeronautical mobile-satellite (OR)					n/a
SMX	Mobile-satellite, except Aeronautical mobile-satellite					n/a
SMXO	Mobile-satellite, except Aeronautical mobile-satellite (OR)					n/a
SMXR	Mobile-satellite, except Aeronautical mobile-satellite (R)					n/a
SO	Space operation	ED	Space telecommand space station			n/a
		EK	Space tracking space station			n/a
		ER	Space telemetering space station			n/a
		ET	Space station in the space operation service			n/a
		TD	Space telecommand earth station in the space operation service	Space operations		8.12
		TK	Space tracking earth station in the space operation service	Space operations		8.12
		TR	Space telemetering earth station in the space operation service	Space operations		8.12
		TT	Earth station in the space operation service	Space operations		8.12
		UD**	Space telecommand mobile earth station in the space operation service	Space operations		8.12

Code	Name of the Radio Communication Service	Class of Station Code	Name of the Class of Station	Systems/ Technologies	Systems Examples	Fee as per Chapter
		UK**	Space tracking mobile earth station in the space operation service	Space operations		8.12
		UR**	Space telemetering mobile earth station in the space operation service	Space operations		8.12
		UT**	Mobile earth station in the space operation service	Space operations		8.6.4
SR	Space research	EH	Space research space station			n/a
		TH	Earth station in the space research service	Space research (active and passive sensors, deep space)		passive: 9.6 active: 8.4.1
		UH**	Mobile earth station in the space research service	Space research (active and passive sensors, deep space)		passive: 9.6 active: 8.6.4
SW	Meteorological-satellite	EM	Space station in the meteorological-satellite service			n/a
		TM	Earth station in the meteorological-satellite service			8.3.3
		UM	Mobile earth station in the meteorological-satellite service			8.3.3
SX	Earth exploration-satellite	EW	Space station in the Earth exploration-satellite service	Earth-exploration-satellite (active and passive sensors, Synthetic aperture radar, Weather satellites);		n/a
		TW	Earth station in the Earth exploration-satellite service	Earth-exploration-satellite (active and passive sensors, Synthetic aperture radar, Weather satellites);		active: 8.3.1 passive: 8.3.2
				Earth exploration-satellite (military)		Article 2 of the Decision
		UW**	Mobile earth station in the Earth exploration-satellite service	Earth-exploration-satellite (active and passive sensors, Synthetic aperture radar, Weather satellites);		active: 8.3.1 passive: 8.3.2
				Earth exploration-satellite (military)		Article 2 of the Decision
SZ	Amateur-satellite	EA	Space station in the amateur-satellite service			n/a
		TA	Space operation earth station in the amateur-satellite service	Amateur-satellite		n/a

Table 128 - Cross-Reference Index

Annex I:

Technical Specifications of the Operation of Ku-Band Aircraft Earth Stations (AES) On Board Aircrafts

1. Aircraft Earth Stations are allowed to operate in Ku-Band on board aircrafts in the uplink Band (14-14.5 GHz) Earth-to-Space, provided that:
   - Aircraft Earth Stations are operated via recognized satellites that provide Fixed Satellite Services (FSS) and Aeronautical Mobile Satellite Services (AMSS) and that have successfully finalized coordination and notification procedures pursuant to the procedures followed in ITU Radio Regulations.
   - The technical and operational requirements of (AES) contained in ITU recommendation (ITU-R M. 1643) are complied with.
   - The (AES) is in compliance with the requirements of European Telecommunication Standards No. (ETSI EN 302 186).
   - (AES) are operated at a height not less than 3000 m above sea level.
   - The operation of (AES) is on a secondary basis.
   - The radiated power does not exceed 50 dB.
   - Foreign (AES) are allowed if they have a valid license issued by the registering countries.
   - An annual usage fee is imposed on aircrafts registered under the Omani flag.
   - Downlink Band (10.7-12.75) Space–to-Earth shall be on the basis of non-protection and non-interference to other protected services.
2. The same fees approved for the provision of GSM services on board aircrafts using GSM-1800 Band shall be applicable, where a registration fee of one thousand Omani Rials (1000) is imposed on the service provider, an annual usage fee of hundred Omani Rials (100) is applicable on aircrafts with (AES) located on board that are registered under the Omani flag.

Annex J:

The technical specifications to operate PMR 446

PMR that are not reprogrammable operating in the band 446 – 446.2 MHz shall be exempted from radio licensing on condition that the conditions, specifications and standards listed in table (129) are met. Users of these systems shall avoid harmful interference with other users and shall not be entitled to protection from this interference.

Requirement	Analogue PMR 446	Digital PMR 446	Remark
Operational Frequency band, MHz	446.0-446.1	446.1-446.2	
Channel spacing, kHz	12.5	12.5 or 6.25	
Lowest carrier/center frequency, MHz	446.00625	$446.1 - \frac{\text{Channel Spacing}}{2}$	
Effective radiated power, mW	≤ 500	≤ 500	
Standard to comply with	ETS 300 296	EN 300 113-2 or EN 301 166-2	Or equivalent technical specifications
Maximum transmitter time/out time		180 seconds	
Individual radio license	Not required	Not required	
Type approval	Required	Required	
Protection from interferences	Not offered	Not offered	
Operation in border areas	Not allowed in distances less than 20 km		
Design	hand portable, and with integral antennas only		

Table 129 - Technical and Regulatory Requirements for PMR 446

Annex K: List of the Systems of Safety Services and Associated Frequencies/Frequency Bands.

Safety of Life systems/ services	Brief definition of service	Frequency Band or channel
Navigational Telex (NAVTEX)	Navigational Telex is an international automated medium frequency direct-printing service for delivery of navigational and meteorological warnings and forecasts, as well as urgent marine safety information to ships.	518 kHz - the main NAVTEX channel 490 kHz - used for broadcasts in local languages (ie: non-English) 4209.5 kHz - allocated for NAVTEX broadcasts in tropical areas - not widely used at the moment.
Automatic Identification System (AIS)	The Automatic Identification System (AIS) is an automated tracking system used on ships and by Vessel Traffic Services (VTS) for identifying and locating vessels by electronically exchanging data with other nearby ships and VTS stations.	161.975 MHz 162.025 MHz
Distress Radio Beacons	Distress radio beacons are tracking transmitters which aid in the detection and location of boats, aircraft, and people in distress. Strictly, they are radiobeacons that interface with worldwide offered service of Cospas-Sarsat which is an international satellite system for search and rescue (SAR). There are three types of distress radio beacons compatible with the Cospas-Sarsat system: • EPIRBs (emergency position-indicating radio beacons) signal maritime distress. • ELTs (emergency locator transmitters) signal aircraft distress. • PLBs (personal locator beacons) are for personal use and are intended to indicate a person in distress who is away from normal emergency services	121.45 MHz-121.55 MHz 243 MHz 406 MHz-406.1 MHz
Emergency Position-Indicating Radio Beacons (EPIRB)	Used for the Global Maritime Distress & Safety System (GMDSS) (Space to Earth)	1544-1545 MHz
RACON (Radar Transponder)	Racon is a radar transponder commonly used to mark maritime navigational hazards. The word is a portmanteau of RAdar and beaCON.	2920-3100 MHz 9200-9500 MHz
Global Maritime Distress & Safety System (GMDSS)	GMDSS frequencies for distress and safety calling using DSC techniques	2 187.5 KHz, 4 207.5 KHz, 6 312 KHz, 8 414.5 KHz, 12 577 KHz, 16 804.5 KHz and 156.525 MHz
	GMDSS frequencies for distress and safety traffic by NBDP telegraphy	2 174.5 KHz, 4 177.5 KHz, 6 268 KHz, 8 376.5 KHz, 12 520 KHz and 16 695 KHz
	GMDSS frequencies for distress and safety traffic by radiotelephony	2 182 KHz, 4 125 KHz, 6 215 KHz, 8 291 KHz, 12 290 KHz, 16 420 KHz and 156.8 MHz
Search and Rescue (SAR) Operations	International frequencies for search and rescue operations	2 182 KHz, 3 023 KHz, 5 680 KHz, 8 364 KHz, 10 003 KHz, 14 993 KHz, 19 993 KHz, 121.5 MHz, 123.1 MHz, 156.3 MHz, 156.8 MHz, 161.975 MHz, 162.025 MHz and 243 MHz

Table 130 – List of the Systems of Safety Services and Associated Frequencies/Frequency Bands

Annex L:

Abbreviations

A	
ADS	Automatic Dependent Surveillance (Aeronautical)
AGA	Air–Ground-Air
AIS	Universal Shipborne Automatic Identification System
ASDE	Airport Surface Detection Equipment
C	
CB	Citizen's Band
CDMA	Code Division Multiple Access
CZF	Coverage Zone Factor
D	
DAB	Digital Audio Broadcasting
DECT	Digital European Cordless Telecommunications
D-GPS	Differential Global Positioning System
DMB	Digital Multimedia Broadcasting
DME	Distance Measuring Equipment
DRM	Digital Radio Mondiale
DSC	Digital Selective Calling
DVB-H	Digital Video Broadcasting - Handheld
DVB-T	Digital Video Broadcasting – Terrestrial
E	
EDGE	Enhanced Data rates for GSM Evolution
EIRP	Equivalent Isotropically Radiated Power
ERP	Effective Radiated Power
ESV	Earth Stations on-board Vessels
ETSI	European Telecommunications Standards Institute
F	
FM	Frequency Modulation
FSS	Fixed-Satellite Service
FWA	Fixed Wireless Access
G	
GHz	Giga Hertz
GMDSS	Global Maritime Distress and Safety System

GMPCS	Global Mobile Personal Communications Systems via Satellite
GSM	Global System for Mobile Communications
H	
HAPS	High Altitude Platform Station
I	
IFF	Identification Friend or Foe
IMT-2000	International Mobile Telecommunications-2000
INMARSAT	International Marine/Maritime Satellite (organisation)
ISM	Industrial, Scientific and Medical
ITU	International Telecommunications Union
J	
JTIDS	Joint Tactical Information and Distribution System
K	
kHz	Kilo Hertz
kW	Kilowatt
L	
LPD	Low Power Devices
M	
m	Meter
MHz	Mega Hertz
MIDS	Multifunctional Information Distribution System
MLS	Microwave Landing System
MSS	Mobile-Satellite Service
mW	Milliwatt
MW	Megawatt
MWS	Multimedia Wireless System
N	
n/a	not applicable
NAVTEX	Narrow-band direct-printing telegraphy system for transmission of navigational and meteorological warnings and urgent information to ships
NBDP	Narrowband Direct Printing
O	
OMR	Omani Rial

P	
P	Power
PAMR	Public Access Mobile Radio
PMR	Private (Professional) Mobile Radio
R	
RDBN	Radiolocation System for Short Range Navigation
RF	Radio Frequency
RFID	Radio Frequency Identification
S	
SAB	Service Ancillary to Broadcasting
SAP	Service Ancillary to Programme making
SAR	Synthetic Aperture Radar
SIT/SUT	Satellite Interactive Terminal / Satellite User Terminal
SNG	Satellite News Gathering
SRDs	Short Range Devices
SRR	Short Range Radar
SSR	Secondary Surveillance Radar
SW	Short Wave
T	
TACAN	Tactical Air Navigation
TRA	Telecommunications Regulatory Authority
TV	Television
U	
UMTS	Universal Mobile Telecommunications System
V	
VLBI	Very Long Baseline Interferometry
VOR	VHF Omnidirectional Radio Range
VSAT	Very Small Aperture Terminal
W	
W	Watt
WLAN	Wireless Local Area Network