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CONTENTS

PAGE

MACRA—Notice of Spectrum Licence Fee

69–76

GENERAL NOTICE NO. 20



MALAWI COMMUNICATIONS REGULATORY AUTHORITY

SPECTRUM LICENCE FEE SCHEDULE

A. INTRODUCTION

1. Pursuant to section 36 (1) of the Communications Act 1998 (Cap 68:01 of the Laws of Malawi), the Authority hereby publishes this Spectrum Licence Fee Schedule.
2. This Schedule replaces the Spectrum Licence Fee Schedule published in the Government Gazette dated 11th November 2016.
3. This Schedule describes the categories of radio services the Authority may license under the Communications Act and the fees payable for such licenses.
4. The application of this Schedule shall be from 1st September 2016.

B. RADIO LICENCE FEES - ADMINISTRATIVE INCENTIVE PRICING

1. Fee Determination

The radio frequency spectrum licence fees payable for each category of Frequency Spectrum shall be determined by an Administrative Incentive Pricing (AIP) Formula described in this Schedule or by application by the Authority of the minimum fees set in the Schedule.

The Authority reserves the right to indicate where the AIP or the Minimum fee shall not apply. Where the AIP formula or the minimum fee is not applicable, the Authority shall indicate the alternative method to be used for licensing spectrum in a particular spectrum band.

2. AIP Formulae

The following formulae shall apply in determining the radio frequency spectrum licence fees:

(a) Point to Multipoint

This formula shall apply to all point to area services except for special services (e.g. Mobile services, aeronautical and maritime etc).

$$\text{Frequency Fee} = \text{UNIT} * \text{FREQ} * \text{BW} * \text{CG} * \text{GEO} * \text{SHR} * \text{APOWER} * \text{UNIB}$$

The fee shall be determined by the multiplication of the unit price (UNIT), the frequency factor (FREQ), the bandwidth in MHz (BW), the congestion factor (CG), the Geographic factor (GEO), the sharing factor (SHR), the area sterilized factor (APOWER) and the unibi-directional factor (UNIBI) where this is applicable for point to area.

(b) Point to Point

This formula shall apply to all fixed links transmitting in point to point mode

$$\text{Frequency Fee} = \text{UNIT} * \text{FREQ} * \text{BW} * \text{CG} * \text{GEO} * \text{SHR} * \text{HOPMINI} * \text{UNIB}$$

The fee shall be determined by the multiplying the unit price (UNIT), the frequency factor (FREQ), the bandwidth (BW) in MHz, the congestion factor (CG), the Geographic factor (GEO), the sharing factor (SHR), the minimum hop length (HOPMINI) and the unibi- directional factor (UNIBI).

(c) VSAT

This formula shall apply to all Earth to Space and Space to Earth Satellite services (e.g. Vsat terminals).

$$\text{VSAT Fee} = (\text{UNIT} * \text{BW} * \text{MF})$$

The fee for VSAT shall be determined by multiplying the unit price (UNIT), the bandwidth (BW) in MHz and the market factor (MF).

(d) Private Mobile Radio (PMR)

This formula shall apply to private mobile radio operating in HF, VHF and UHF bands.

(i) PMR Fee = (Min fee*No. of Devices*App. Factor) for VHF and UHF

(ii) PMR Fee = (Point to Multipoint* No. of Devices) for HF

Where a PMR device is tuned for a range of frequencies the PMR fee shall be determined by adding the PMR fee stipulated in paragraph (ii) above and the minimum fee for each additional tunable frequency.

3. Minimum Fee

- (1) The Minimum Fee shall be \$50 for all the services
- (2) The Authority may from time to time revise the minimum fee.
- (3) Where the Radio Frequency Spectrum Licence fee is defined by formula and the result is lower than the minimum fee, the minimum fee shall apply.

4. Factors and Look up Tables

- (1) Unit Price—the Unit Price (UNIT) is applied per MHz of bandwidth. UNIT is \$185 for all services. The Authority may from time to time revise the Unit Price.
- (2) Bandwidth—The bandwidth factor (BW) is the assigned frequency spectrum bandwidth expressed in MHz. The Authority reserves the right to determine Spectrum bands that shall be paired or not in accordance with ITU-R recommendations,
- (3) Frequency factor The frequency factor (FREQ) denotes the frequency ranges within the usable communication range and relates to the propagation characteristics of the various frequency bands. The frequency factor takes into account the “K” factor and the “Sweet Spot”.

The following are the ranges of the frequency bands and the corresponding frequency factors.

TABLE OF FACTORS

Frequency Range (MHz)		Freq Factors
From	To	
0.083	108.0	1.2
108	174.0	1.1
174	694.0	1.0
694	960.0	1.5
960	2000.0	1.5
2000	2290.0	1.5
2290	4400.0	1
4400	7074.0	0.9
7075	9200.0	0.7
9200	10500.0	0.6
10500	17300.0	0.5
17300	25500.0	0.3
25500	39500.0	0.2
39500	100000	0.07

The frequency spectrum bands are segmented in accordance with the Malawi National Frequency Allocation Plan (MNFAP). The Authority reserves the rights to review frequency factor table in line with the MNFAP.

(4) **Congestion Factor**

CONGESTION	CG Factor
Congested	1.0
Not Congested	0.5

The frequency band shall be deemed congested if 75% of the available spectrum is assigned or if there is a waiting list at the particular time of application.

(5) **Geographic Factor**—defines the total coverage area based on the economic activity of the identified area. The zones shall include the following—

- Urban—Blantyre, Lilongwe, Mzuzu and Zomba cities, approximately covers an area of 1,000Km².
- Semi urban—District centers of all districts in the Republic of Malawi except, Blantyre, Lilongwe, Mzuzu and Zomba and covers an area of approximately 20, 000Km²
- Rural areas—any other areas other than urban and semi urban and covers an area of approximately 80, 000 Km²

Geo Area	Geo Factor
Rural	0.3
Semi urban	0.7
Urban	1

In case of overlapping geographic areas, the highest factor for the overlapping areas shall apply for point to point applications.

- (6) **Unibi-Directional Factor (UNIBI)**—defines the direction of propagation where bi-directional refers to two way transmission in both directions(transmit and receive) and uni-directional refers to one-way transmission.

UNIBI	Point to Point	Point to Area
Bidirectional	1.0	1.0
Unidirectional	0.7	0.5

- (7) **Sharing Factor (SHR)**

SHARING	VALUE
Exclusive Use	1.0
Shared Use	0.5

A band shall be deemed shared when the same spectrum portion within a band is assigned to two or more licencees in different geographic locations. A band shall be deemed exclusive when the spectrum portion cannot be assigned to another licensee regardless of geographical location. Sharing shall apply between operators and not between services. The authority shall determine whether a frequency band can be used on an exclusive or shared basis.

- (8) **HOPMINI**—refers to the square root of the minimum path length divided by the actual path length. The HOPMINI is calculated using ITU-R recommendations (REC ITU-R P.530-14 - Propagation data and prediction method).

Frequency (MHz)		Minimum path Length
From	To	Km
8.3	173.999	100
174	789.999	80
790	959.999	60
960	3000	45
3300	4299	42
4299	5925	38
5925	6500	35
7000	8600	28
10000	10690	18
12600	13300	15
14300	15500	12
17500	19800	9
21000	24000	4
25900	29000	2
35900	41000	1

- (9) **APower**—reflects the area of frequency that is denied to other users as a result of frequency assignment. It applies to Omni coverage (Point to Area) and mobile services. It is calculated considering the total coverage area of Malawi.

Area of Malawi is 118 480km

Area (Km ²)		Power Factor
From	To	
0	1	0.5
1.999	10	2
10.999	50	4
50.999	500	8
500.999	5000	12
5000.999	20000	22
20000.999	50000	90
50000.999	75000	180
75000.9999	118000	300

- (10) **Market Factor**—denotes the type of market where a service is used. It applies to ground component of satellite service.

Terminal Type	Minimum BW MHz)	Factor
Corporate	2	4.8
Ground hub	5	10.8
Mobile	1	7.2
Private	1	1.44

- (11) **Application Factor**—defines how a PMR is applied in the market

PMR application	Factor
Repeater	5
Base	4
Mobile	2
Potable	1

5. Spectrum fees reference table

#	SERVICE TYPE	SERVICE SUB CATEGORY	FEE BASIS
1	Broadcasting	SW Sound Broadcasting	Point to Area Formula
		MW Sound Broadcasting	Point to Area Formula
		FM Sound Broadcasting	Point to Area Formula
		VHF/UHF Television	Point to Area Formula
2	Amateur	Amateur Radio	Minimum fee per device
		Citizen Band	Minimum fee per device
3	Aeronautical	Aeronautical HF	Point to Area Formula and Number of devices
		Aeronautical VHF/UHF	PMR Formula
4	Land Mobile Service	VHF/UHF Centralized Radio Alarm System	Minimum fee per base
		VHF/UHF PMR Vehicle Mobile Station	PMR Formula
		VHF/UHF PMR Handheld	PMR Formula
		VHF/UHF PMR Fixed station	PMR Formula
		VHF/UHF PMR repeater station	PMR Formula
		Mobile (GSM/CDMA/3G/4G)	Point to area
5	Maritime	Maritime station	Point to Area Formula
6	Satellite	VSAT SOHO	VSAT formula
		VSAT Mobile	VSAT formula
		VSAT cooperate	VSAT formula
		VSAT ground HUB	VSAT formula
7	Fixed Services	VHF/UHF Radiotelephone Link	Point to Point
		Microwave Radio Link Tx	Point to point

NOTE:

Usage of the ISM bands by any Licensee shall attract an authorization fees of USD400 annually.

Competitive tendering for radio spectrum licenses

Notwithstanding the application of the AIP, the Authority shall be at liberty pursuant to the Communications Act, to issue a public tender or use any other competitive model for the award of of radio license

C. TERMS AND CONDITIONS APPLICABLE TO ALL RADIO LICENCES

1. These terms and conditions shall apply to all radio licenses.
2. Authority shall assign spectrum upon full payment of the applicable radio (spectrum) license fees by the Licensee.
3. A Licensee, before applying for a radio spectrum license, shall be required to obtain an appropriate service license from the Authority.
4. The spectrum fees shall be non-refundable once the spectrum has been assigned.
5. All radio (spectrum) Licenses issued by the Authority shall be valid for a period of one (1) year unless otherwise specify by the Authority
6. A Licensee shall apply in writing for renewal of its radio (radio) license one month before the expiry of the license.
7. Renewal of a radio (spectrum) license shall be subject to a technical verification by the Authority of appropriate spectrum utilization by the Licensee during the licence period.
8. A radio (spectrum) licence shall be revoked if the licensee does not put the assigned spectrum to use within six (6) months from the date of assignment or within such period as the Authority may prescribe.
9. The Authority reserves the right not to renew any radio (spectrum) licence if the licensee is in breach of any licence term or condition.
10. The Authority may from time to time revise the radio frequency spectrum fees.
11. A radio licence issued by the Authority shall confer on the Licensee rights of use and not proprietary rights and the Authority may re-allocate or re-assign the frequencies in line with International Radio-communications Regulations and applicable national regulations.
12. A Licensee shall not use any frequencies other than those assigned by the Authority.
13. A licensee shall not use any frequencies for any other purpose other than that prescribed by the Authority in the Licensee.
14. The Authority shall in addition to any other appropriate regulatory sanctions under the Act or appropriate.
15. Regulations, require any person found guilty of illegal usage of radio frequency spectrum to pay a Monetary penalty of up to 300% of the normal annual applicable fees.

NOTE:

Usage of the ISM bands by any Licensee shall attract authorization fees of USD 400 annually.

D. DEFINITIONS

Application factor	Is a coefficient factor in the spectrum fee formula that defines how a PMR service is deployed in the network.
Aster factor (Power Factor)	Is a coefficient factor set in the spectrum fee formula to reflect the electromagnetic pollution into the environment in the use of the frequency assigned to the licensee.
Bandwidth factor	Is a coefficient factor set in the spectrum fee formula to reflect the bandwidth assigned.
Congestion factor	Is a coefficient factor set in the spectrum fee formula to reflect the demand for the spectrum both in a given geographical area and in a spectrum band. Where assignment exceeds 75% of the available spectrum in the band, the band is considered congested.

Frequency Band Factor (FREQ)	Is a coefficient factor set in the spectrum fee formula to reflect the physical properties of frequency bands or a specific frequency covered in the National Frequency Allocation Plan.
Geographical Factor (GEO)	Is a coefficient factor set in spectrum fee formula to reflect economic activity differences in the geographical area of Malawi i.e. urban, semi-urban and rural areas.
Hop Mini Factor	a coefficient factor set in the spectrum fee formula that is applied to point to point frequency spectrum assignment where the recommended hop length is compared to the actual hop length deployed for a particular microwave link.
The 'K' factor	is the difference between the theoretical propagation paths and actual radio paths under line of sight propagation as influenced by the curvature of the earth.
Market Factor (MF)	a coefficient factor set to differentiate between the different Vsat applications in the market.
Minimum Price	Is the lowest fee set by the Regulator to be paid by the licensee for a radio frequency spectrum.
Opportunity Cost in AIP	Is the estimated savings in other resources if the same spectrum were redeployed to provide another service, or the extra costs which would be incurred if additional spectrum is not available to provide the service for which it is currently employed.
Sharing Factor	Is a coefficient factor set in the spectrum fee formula that is applied to reflect the exclusivity or sole usage of frequency spectrum depicting whether the spectrum can be shared or not.
Spectrum Auctions	Is a method for assigning spectrum at the time of its first issue by the spectrum regulator to those who value the spectrum most highly. This is done where demand of spectrum is higher than supply of the same. The highest bidder is awarded the license.
Spectrum Frequency Fees	Is the amount of money charged to spectrum users or licensees in return for renting spectrum as a resource
Sweet spot	Is the frequency range which offers an excellent compromise between the useful range of the signals, better building penetration, and the antenna size on mobile devices. It usually ranges from 300MHz to 3GHz.
Uni-directional Factor	Is a coefficient factor set in the spectrum fee formula that is applied when only a single link is assigned.
Unit Price	this is the price that is applied in the spectrum fee formula when the radio frequency spectrum license fee is calculated. The Unit Price is a multiplier in the formulae.