MCMC SRSP-507b FWA
10 March 2006

Standard Radio System Plan

REQUIREMENTS FOR FIXED WIRELESS ACCESS (FWA) SYSTEMS

OPERATING IN THE FREQUENCY BAND

10.15 GHz TO 10.30 GHz
AND
10.50 GHz TO 10.65 GHz

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TABLE OF CONTENTS

1.0 GLOSSARY

1.1 The terms used in this document may be found in the document SRSP Glossary which can be downloaded from MCMC website. (http://www.mcmc.gov.my/what_we_do/spectrum/srsp.asp)

REQUIREMENTS FOR FIXED WIRELESS ACCESS (FWA) SYSTEMS OPERATING IN THE FREQUENCY BAND 10.15 GHz to 10.30 GHz and 10.50 GHz to 10.65 GHz

2.0 INTENT

2.1 This Standard Radio System Plan (SRSP) states the requirements for the utilisation of the frequency band 10.15 GHz to 10.30 GHz and 10.50 GHz to 10.65 GHz for **Fixed Wireless Access** (FWA) systems in Malaysia.

2.2 FWA systems are two-way point-to-point or point-to-multipoint radio systems consisting of FWA distribution hub stations and their associated subscriber fixed stations (or FWA access devices).

2.3 FWA services are intended for providing last mile broadband connectivity to subscribers and can include applications such as voice, video, images, interactive multimedia and high-speed data.

2.4 In general, a SRSP is a document designed to provide information on the minimum requirements in the use of a frequency band as described in the Malaysian Table of Frequency Allocation (see **Appendix A**). It provides information on technical characteristics of radio systems, frequency channelling, coordination initiatives in order to maximise the utilisation, minimise interference and optimise the usage of the band. It is intended to regulate the usage of spectrum and does not attempt to establish any detailed equipment standards.

3.0 GENERAL

3.1 Technical characteristics of equipment used in FWA systems shall conform to all applicable Malaysian standards, international standards, International Telecommunications Union (ITU) and its radio regulations as agreed and adopted by Malaysia.

3.2 All FWA installations must comply with safety rules as defined by applicable standards.

3.3 The equipment used shall be certified under the Communications and Multimedia (Technical Standards) Regulations 2000.

3.4 The allocation and allotment of these frequency bands and the information in this SRSP are subject to review from time to time to reflect new developments in the communications and multimedia industry (C&M).

4.0 CHANNELLING PLAN

4.1 FWA radio systems operating in these bands shall use a duplex frequency plan. The 10.00 GHz to 10.70 GHz band is divided into sub-bands for duplex use. Issuance of assignment shall be made based on the plan in **Appendix B**.

4.2 The channelling plan for the band has been designed according to the recommendation in **CEPT/ERC/REC 12-05 E**. The spectrum bands from 10.15 GHz to 10.30 GHz and 10.50 GHz to 10.65 GHz are channelled as shown below:

The radio frequency channel arrangements for the 10 GHz to 10.68 GHz band are based on channel slots of 0.5 MHz and are derived as follows:

$fp = fo - 1701 + 0.5p$ (MHz)
where p ranges from 0 to 1359

Let *fo* be the reference frequency of the pattern = 11701 MHz and $f p$ be the lower edge frequency (MHz) of each slot.

Within the band 10.15 MHz to 10.3 GHz (p=300 to 599) to paired with 10.5 GHz to 10.65 GHz (p=1000 to 1299) equipment will utilize a duplex Tx/Rx separation of 350 MHz.

For point-to-multipoint systems, discrete channel centre frequencies can be obtained from within the 0.5 MHz slots.

4.3 For other systems the channel centre frequencies could be derived by multiplication of the 0.5 MHz slots as indicated below:

Let *fo* be the reference frequency of the pattern = 11701 MHz
fn be the center frequency (MHz) of a radio frequency channel in the lower half of the band.
$f'n$ be the center frequency (MHz) of a radio frequency channel in the upper half of the band

For systems with a carrier spacing of 3.5 MHz
Lower half of band $fn = (fo - 1552.25 + 3.5\ n)$ MHz
Upper half of band $f'n = (fo - 1202.25 + 3.5\ n)$ MHz
Where, n = 1, 2, …,42

4.4 Each operator will be allowed to use frequency channels within any blocks or sub blocks illustrated in **Appendix B** (Blocks A to E). Blocks A to E are each 28 MHz wide. Each of Blocks A to E are then further divided into 8 sub-blocks of 3.5MHz.

The following formula describes the start frequencies for these blocks (A to E).

Lower band start frequencies	10154 + n*28 MHz	*n = 0 to 4* Block A: n=0 Block E: n=4
Upper band start frequencies	10504 + n*28 MHz	

5.0 REQUIREMENTS FOR USAGE OF SPECTRUM

5.1 This SRSP covers the minimum key characteristics considered necessary in order to make the best use of the available frequencies.

5.2 These FWA bands are not limited in their use for direct radio connection between a radio fixed station and subscribers in a point-to-point or point-to-multipoint configuration. It may also be used for backhaul links from a base station to an exchange.

5.3 Only systems using digital technologies that promote spectral efficiency will be issued with an assignment. Capacity enhancing digital techniques are being developed rapidly and such techniques that promote efficient use of spectrum, without reducing quality of service are encouraged.

5.4 In some cases, a radio system conforming to the requirements of this SRSP may require modifications if harmful interference is caused to other radio stations or systems.

5.5 The allocation of spectrum and shared services within these bands are found in the Malaysian Spectrum Plan and an extract of it is shown in Table 1 in **Appendix A**.

6.0 PRINCIPLES OF ASSIGNMENT

6.1 Authorisation to use the FWA spectrum for the **central/hub station** apparatus is by way of Apparatus Assignment (AA) and the **terminal station or subscriber's FWA access device** installed at customer premises is by way of Class Assignment (CA). Please refer to www.mcmc.gov.my for the conditions of use in the Notification of Class for the FWA subscriber terminal access devices.

6.2 Eligible persons who may apply for assignments are:

6.2.1 Network Facilities Provider Individual (NFP(I)) licence holder, who provides radiocommunication transmitters and links.

6.3 Applicants are required to:

6.3.1 Submit AA application for the apparatus on the prescribed AA forms.

6.3.2 Submit a roll out plan (minimum of 5 central/hub per every defined geographic area set out in **Appendix C** using the requested spectrum within a block) showing the sites or locations and implementation timelines (at least for the period of one (1) year) for each site or location in the defined geographic area.

6.3.3 Submit topographical maps (preferably in electronic format) which clearly show the coverage boundary of each proposed service area.

6.4 The AA for these bands shall be valid for a period of five (5) years or such lesser period as specified in the AA. AA holders may apply for a new assignment at least sixty (60) days before the expiry date.

6.5 Issuance of an AA is also subject to successful coordination among assigned stations and with neighbouring administrations where it applies.

6.6 To further facilitate planning and efficiency in spectrum management, upon successful application the NFP(I) licence holder shall be allocated with the specific spectrum sub-block/s with a minimum of 8 x 3.5 MHz (**Appendix B**) in geographic block as in **Appendix C** of this document. Such arrangements are only for administrative or spectrum management purposes in order to facilitate the NFP(I) licensees in their roll out planning. Spectrum in any areas not utilised or under utilised, shall be opened to other NFP(I) licensees in the queue.

6.7 Interested applicants are invited to apply when the MCMC issues the relevant notice for application.

6.8 Applicants are advised to refer to the Fixed Service Allocation webpage (http://www.mcmc.gov.my/what_we_do/spectrum/Fixed.asp) to get the information on existing allocation in these bands.

6.9 Application for available blocks after the initial offer period shall be considered on a first-come-first-served basis.

7.0 IMPLEMENTATION

7.1 This SRSP shall be effective three months after the date of issuance of this document. MCMC SRSP 507b, September 2003 Issue 3 is hereby revoked.

7.2 Notice to existing assignment holders:

7.2.1 Installations before the effective date are allowed to operate under non-interference basis (NIB) to new installations complying with this SRSP.

7.2.2 No new apparatus assignments operating in the band 10.15 GHz to 10.30 GHz and 10.50 GHz to 10.65 GHz shall be approved unless they comply with this SRSP.

8.0 COORDINATION REQUIREMENT

8.1 Use of these frequency bands shall require coordination with the neighbouring countries within the following coordination zones of 50 kilometres from our neighbouring countries. Note that the above coordination distance is continuously being reviewed with our neighbouring countries.

8.2 Technical analysis is carried out by MCMC before an assignment is issued. Assignments for FWA are issued based on defined geographic areas. Operator-to-operator coordination at the defined geographic boundaries may be required to avoid interference.

8.3 FWA network facility providers must coordinate their frequency requirements with existing licensed terrestrial point-to-point systems operating in the band 10.50 GHz to 10.65 GHz to avoid interference.

8.4 In the event of any harmful interference, MCMC will require affected users to carry out an operator-to-operator coordination. In the event that the interference remained unresolved after 24 hours by the operators, the affected parties may escalate the matter to MCMC for a resolution. MCMC will decide the necessary modifications and schedule of modifications to resolve the dispute.

8.5 Assignment holders are expected to take full advantage of interference mitigation techniques such as antenna discrimination, tilt, polarization, frequency discrimination, shielding/blocking (introduce diffraction loss), site selection, and/or power control to facilitate the coordination of systems

9.0 REFERENCES

For further information kindly refer to the following:

9.1 **ITU-R SF.406-8 (04/93)** Maximum Equivalent Isotropically Radiated Power of Radio Relay Transmitters Operating in the Frequency Bands Shared with Fixed Satellite Services.

9.2 **ITU-R SF.765-1 (02/03)** Intersection of Radio Relay Beams with Orbits used by Fixed Sat Space Stations

9.3 **Article 21 Radio Regulations** Terrestrial and space services sharing frequency bands above 1GHz.

9.4 **CEPT/ERC/Recommendation 12-05 E** Harmonised radio frequency channel arrangements and block allocations for low and medium capacity systems in the band 3400 MHz to 3600 MHz

9.5 **ITU-R F.1568-1 Radio-frequency block arrangements for fixed wireless access systems in the range 10.15-10.3/10.5-10.65 GHz**

Issued by:

Malaysian Communications and Multimedia Commission

Date: 10 March 2006

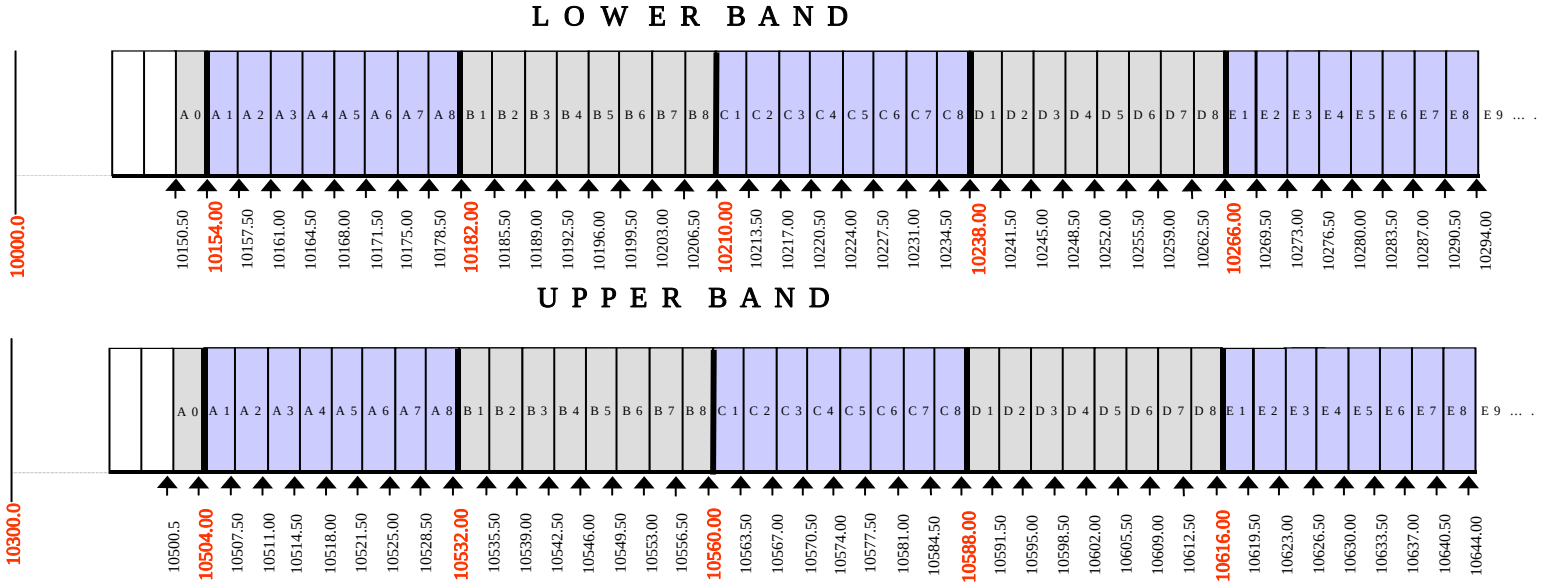
APPENDIX A: TABLE OF FREQUENCY ALLOCATION 10000 MHz to 10700 MHz

Frequency Band (GHz)	Malaysian Allocation	Notes/Future use
10-10.45	FIXED MLA35 MOBILE RADIOLOCATION Amateur MLA35	**MLA35**: The frequency bands 3400 – 3700 MHz, 10000 – 10700 MHz is allocated for Fixed Wireless Access (FWA) service.
10.45-10.5	RADIOLOCATION Amateur Amateur-Satellite MLA35	**MLA35**: The frequency bands 3400 – 3700 MHz, 10000 – 10700 MHz is allocated for Fixed Wireless Access (FWA) service.
10.5-10.55	FIXED MLA35 MOBILE RADIOLOCATION	**MLA35**: The frequency bands 3400 – 3700 MHz, 10000 – 10700 MHz is allocated for Fixed Wireless Access (FWA) service.
10.55-10.6	FIXED MLA35 MOBILE except aeronautical mobile Radiolocation	**MLA35**: The frequency bands 3400 – 3700 MHz, 10000 – 10700 MHz is allocated for Fixed Wireless Access (FWA) service.
10.6-10.68	EARTH EXPLORATION-SATELLITE (passive) FIXED MLA35 MOBILE except aeronautical mobile RADIO ASTRONOMY SPACE RESEARCH (passive) Radiolocation S5.482	**Bands 10.6 – 10.7 allocation to ESS** **MLA35: The frequency bands 3400 – 3700 MHz, 10000 – 10700 MHz is allocated for Fixed Wireless Access (FWA) service.**
10.68-10.7	EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) MLA35	**MLA35**: The frequency bands 3400 – 3700 MHz, 10000 – 10700 MHz is allocated for Fixed Wireless Access (FWA) service.

Footnote:

5.482 - In the band 10.6-10.68 GHz, stations of the fixed and mobile, except aeronautical mobile, services shall be limited to a maximum equivalent isotropically radiated power of 40 dBW and the power delivered to the antenna shall not exceed –3 dBW. These limits may be exceeded subject to agreement obtained under No. 9.21. However, in Saudi Arabia, Armenia, Azerbaijan, Bahrain, Bangladesh, Belarus, China, the United Arab Emirates, Georgia, India, Indonesia, Iran (Islamic Republic of), Iraq, Japan, Kazakhstan, Kuwait, Latvia, Lebanon, Moldova, Nigeria, Uzbekistan, Pakistan, the Philippines, Qatar, Syria, Kyrgyzstan, Russian Federation, Tajikistan, Turkmenistan and Ukraine, the restrictions on the fixed and mobile, except aeronautical mobile, services are not applicable.

APPENDIX B: CHANNELLING PLAN FOR FWA (10.15 GHz – 10.65 GHz)



APPENDIX C: DEFINED GEOGRAPHIC AREA

Area	Geographic Blocks
1	Wilayah Persekutuan Putrajaya/Wilayah Persekutuan Kuala Lumpur/Selangor
2	Pulau Pinang
3	Johor
4	Kedah
5	Perak
6	Pahang
7	Perlis
8	Melaka
9	Negeri Sembilan
10	Kelantan
11	Terengganu
12	Sabah/Wilayah Persekutuan Labuan
13	Sarawak