MCMC SRSP 536 AS
15 February 2007

Standard Radio System Plan

REQUIREMENTS FOR AMATEUR SERVICE OPERATING IN THE FREQUENCY BAND FROM 144 MHz TO 148 MHz

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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 AMATEUR SERVICE
OPERATING IN THE FREQUENCY BAND FROM 144 MHz TO 148 MHz

2.0 INTENT

2.1 This Standard Radio System Plan (SRSP) states the requirements for the utilisation of the frequency band 144 MHz to 148 MHz for **Amateur Service** (AS) in Malaysia.

2.2 The intended users of AS are holders of Amateur Radio Operator Certificate (AROC) Class A and B that use the service for non-commercial communications and to further their interest in radio techniques and experimentation. It may also be used by them to set up or establish communications to support disaster recovery operations.

2.3 AS systems are two-way radio systems operating in simplex or duplex mode and consists of fixed and mobile terminals and repeater and beacon stations. AS systems are used to carry non-commercial voice, audio, data and video communications.

2.4 In general, this SRSP is designed to provide information on the minimum requirements in the use of the frequency band as described in the Spectrum Plan (see **Appendix A**). It provides information on technical characteristics of radio systems, channelling of frequencies, coordination initiatives in order to maximise the utilisation, minimise interference and optimise the usage of the band.

2.5 The use of the frequency band 146MHz to 148MHz for fixed and mobile service in private networks is covered under a different SRSP.

3.0 GENERAL

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

3.2 All AS 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 this SRSP are subject to review from time to time for more efficient utilisation and management of spectrum, or for the improvement of the services offered by such systems.

4.0 CHANNELLING PLAN

4.1 The SRSP defines a frequency band 144MHz to 148MHz providing a total bandwidth of 4MHz for the AS radio systems. The channels arrangement in the frequency band of 144 MHz to 148 MHz are shown in Appendix B.

4.2 The use of the spectrum is shared by all Amateur Service assignment holders in Malaysia, and is the most frequently used band for amateur communications. The growth in particular in Amateur Class B holders means that there may be potential congestion and interference due to future demand in the VHF portion of the spectrum.

4.3 AS and Amateur Satellite Service (ASS) are the primary services in the frequency band 144 MHz to 146 MHz. AS, Fixed Service and Mobile Service are the primary services in the frequency band 146 MHz to 148 MHz.

4.4 The proposed frequency band plan is designed to maximise the utilisation, minimise interference and optimise the usage of the band.

4.5 Assignment holders are required to observe the conditions and mode of operations as provided in the channelling plan to avoid interference and congestion of the usage of this frequency bands.

4.6 The proposed frequency band plan is designed to maximise the utilisation, minimise interference and optimise the usage of the band.

5.0 REQUIREMENT 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 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.

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

5.4 The usage of this AS band is not limited to direct radio connection between amateur stations and it is also use for radio links (if any) from an amateur station to an amateur repeater station.

5.5 All stations are forbidden to carry out unnecessary transmissions, or the transmission of superfluous signals, or the transmission of false or misleading signals, or the transmission of signals without identification (except as provided for in Article 19 of ITU RR[1]).

5.6 Transmitting stations shall radiate only as much power as is necessary to ensure a satisfactory communications.

5.7 In order to reduce interference and maximise frequency re-use and capacity, the intended users of AS must ensure that:

5.7.1 location of transmitting stations shall be selected with particular care;
5.7.2 radiation in and reception from unnecessary directions shall be minimized by taking the maximum practical advantage of the properties of directional antennae whenever it operationally permits;
5.7.3 choice and use of transmitters and receivers shall be in accordance with the provisions of Article 3 of ITU RR; and
5.7.4 conditions specified under No. 22.1 of ITU RR shall be adhered.

5.8 Special consideration shall be given to avoid interference on distress and safety frequencies, those related to distress and safety identified in Article 31 of ITU RR and Appendix 13 of ITU RR, and those related to safety and regularity of flight identified in Appendix 27 of ITU RR.

5.9 The out-of-band emissions of transmitting stations should not cause harmful interference to services which operate in adjacent bands in accordance with these Regulations and which use receivers in conformity with relevant ITU-RR such as sections Nos. 3.3, 3.11, 3.12, 3.13.

6.0 PRINCIPLES OF ASSIGNMENT

6.1 Authorisation to use the AS spectrum is by way of **Apparatus Assignment (AA)**.

6.2 Eligible persons who may apply for AA are:

6.2.1 Individuals who have obtained the AROC in the designated skill areas as specified in the Third Schedule of the Communications and Multimedia (Technical Standards) Regulations 2000; or

6.2.2 Amateur clubs or societies with at least one resident member who have obtained the AROC in the designated skill areas as specified in the Third Schedule of the Communications and Multimedia (Technical Standards) Regulations 2000;

[1] The International Telecommunication Union Radio Regulations shall be read together with its appendices, and is part of the Constitution and Convention of International Telecommunication Union

6.3 AA for AS shall be issued on the following basis:

6.3.1 For beacons and repeaters, AA shall only be issued to amateur clubs or societies which have been duly registered with the Registrar of Societies.

6.3.2 For transportable beacons and repeaters, AA shall only be issued for special event or disaster communication purposes. The duration of the AA for such repeaters shall not exceed twelve months.

6.4 AA issued to successful applicant shall be subject to further additional conditions specified in **Appendix C**.

6.5 Applicants are required to:

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

6.5.2 For fixed location beacons and repeaters, the applicant shall provide to the Commission the supporting documents that the owner of the building, premise or land had granted permission for the installation of the apparatus and antenna set-up. Alternative supporting documentation in the form of agreement with a telecommunication company or telecommunication infrastructure provider on the use of their building, premise or land would also suffice as evidence.

6.6 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 shall apply for a new assignment at least sixty (60) days before the expiry date.

6.7 The application for AA for a repeater and beacon shall be considered on a first come first served basis in accordance with the arrangement of frequencies specified in the **Appendix D**.

6.8 A call-sign will be issued to each amateur station in accordance with the Guideline on the Allocation of Call Sign to the Amateur Radio Service issued by the Commission.

6.9 Issuance of an AA is also subject to successful co-ordination among assigned stations and with neighbouring countries where it applies.

7.0 IMPLEMENTATION PLAN

7.1 This SRSP shall be effective three months after the date of issuance of this document.

7.2 Existing installations which are currently in used and are not complying with this SRSP are allowed to operate without causing harmful interference to new installations until 31 March 2010.

7.3 No AA shall be issued to any person unless they comply with this SRSP.

8.0 CO-ORDINATION REQUIREMENTS

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

8.2 In the event of harmful interference, the Commission will require affected users to carry out an user-to-user coordination. In the event that the harmful interference remained unresolved after 24 hours by the users, the affected parties may escalate the matter to the Commission for a resolution. The Commission will determine the necessary modifications and schedule of modifications to resolve the harmful interference.

8.3 The installation of amateur repeater stations shall be coordinated based on the locations as shown in **Appendix E.** These specified locations are a guide to provide reasonable nationwide coverage and with minimum number of sites.

9.0 REFERENCE

9.1 Spectrum Plan Issue November 2006 Edition.

9.2 Guideline on the Allocation of Call Sign to the Amateur Radio Service

9.3 Guideline for Amateur Radio Services in Malaysia

Issued by:

Malaysian Communications and Multimedia Commission
15 February 2007

APPENDIX A

Extract from Spectrum Plan

Frequency Band (MHz)	ITU Allocation			Malaysian Allocation
	Region 1	Region 2	Region 3	
144-146	AMATEUR AMATEUR-SATELLITE 5.216			AMATEUR MLA28 AMATEUR-SATELLITE MLA27
146-148	FIXED MOBILE except aeronautical mobile (R)	AMATEUR 5.217	AMATEUR FIXED MOBILE 5.217	AMATEUR MLA28 FIXED MOBILE MLA19

Footnotes:

MLA19 Technical Specifications for RPS 001
MLA27 Technical Specifications for RPS 003
MLA28 Standard Radio System Plan: Requirements for Radio Amateur Service Operating in the Frequency Band 144 MHz to 148 MHz

APPENDIX B

Channelised Band Plan 144.0000 to 148.0000 MHz (1/4)

CHANNEL NO.	FREQUENCY (MHz)		NOTE
	Transmit (Tx)	Receive (Rx)	
NA	144.0000 to 144.1000		Moonbounce & Terrestrial CW. Frequency 144.05 MHz is calling channel for CW.
NA	144.1000 to 144.2500		All Mode (CW/SSB)
NA	144.2600 to 144.5750		Simplex & All Modes (freq. 144.26 MHz is for Emergency Communications)
	144.6250		Simplex & Digital Mode. Emergency Communications (12.5 kHz ch. bandwidth)
	144.6375		
	144.6500		
	144.6625		
	144.6750		
	144.6875		
	144.7000		
	144.7250		**Frequency band:** 144.7 MHz to 145.0 MHz Simplex **System** & Channel bandwidth = 25 kHz (freq. 144.825 MHz & 144.875 MHz are spot freq. for internet voice gateway)
	144.7500		
	144.7750		
	144.8000		
	144.8250		
	144.8500		
	144.8750		
	144.9000		
	144.9250		**Frequency band:** 144.7 MHz to 145.0 MHz Simplex **System** & Channel bandwidth = 25 kHz
	144.9500		
	144.9750		
	145.0000		
RV48	145.0000	145.6000	**Frequency band:** 145.0 MHz to 145.2 MHz / 145.6 MHz to 145.8 MHz & **Channeling Plan** to be use from a repeater station (Tx/Rx separation = 0.6 MHz & channel bandwidth = 12.5 kHz)
RV49	145.0125	145.6125	
RV50	145.0250	145.6250	
RV51	145.0375	145.6375	
RV52	145.0500	145.6500	
RV53	145.0625	145.6625	
RV54	145.0750	145.6750	
RV55	145.0875	145.6875	
RV56	145.1000	145.7000	
RV57	145.1125	145.7125	
RV58	145.1250	145.7250	
RV59	145.1375	145.7375	
RV60	145.1500	145.7500	
RV61	145.1625	145.7625	
RV62	145.1750	145.7750	
RV63	145.1875	145.7875	

Channelised Band Plan 144.0000 to 148.0000 MHz (2/4)

CHANNEL NO.	FREQUENCY (MHz)		NOTE
	Transmit (Tx)	Receive (Rx)	
V16	145.2000		Not Assigned
V17	145.2125		**Frequency band:** 145.2 MHz to 145.6 MHz **Simplex System** & Channel bandwidth = 12.5 kHz.
V18	145.2250		
V19	145.2375		
V20	145.2500		
V21	145.2625		
V22	145.2750		
V23	145.2875		
V24	145.3000		
V25	145.3125		
V26	145.3250		
V27	145.3375		
V28	145.3500		
V29	145.3625		
V30	145.3750		
V31	145.3875		
V32	145.4000		
V33	145.4125		
V34	145.4250		
V35	145.4375		
V36	145.4500		
V37	145.4625		
V38	145.4750		
V39	145.4875		

CHANNEL NO.	FREQUENCY (MHz)		NOTE
	Transmit (Tx)	Receive (Rx)	
V40	145.5000		**Frequency band**: 145.2 MHz to 145.6 MHz **Simplex System** & Channel bandwidth = 12.5 kHz.
V41	145.5125		
V42	145.5250		
V43	145.5375		
V44	145.5500		
V45	145.5625		
V46	145.5750		
V47	145.5875		
V48	146.4000		**Frequency band:** 146.4 MHz to 146.6 MHz **Simplex System** & Channel bandwidth = 12.5 kHz.
V49	146.4125		
V50	146.4250		
V51	146.4375		
V52	146.4500		
V53	146.4625		
V54	146.4750		
V55	146.4875		
V56	146.5000		
V57	146.5125		
V58	146.5250		
V59	146.5375		
V60	146.5500		
V61	146.5625		
V62	146.5750		
V63	146.5875		

Channelised Band Plan 144.0000 to 148.0000 MHz (3/4)

CHANNEL NO.	FREQUENCY (MHz)		NOTE
	Transmit (Tx)	Receive (Rx)	
NA	145.8000 to 146.0000		Satellite Portion
RV64	146.0125	146.6125	**Frequecy Band:** 146 MHz to 146.4 MHz/146.6 MHz to 147.0 MHz: **Channeling Plan** to be used for a repeater station (Tx/Rx separation = 0.6 MHz & channel bandwidth = 12.5 kHz)
RV65	146.0250	146.6250	
RV66	146.0375	146.6375	
RV67	146.0500	146.6500	
RV68	146.0625	146.6625	
RV69	146.0750	146.6750	
RV70	146.0875	146.6875	
RV71	146.1000	146.7000	
RV72	146.1125	146.7125	
RV73	146.1250	146.7250	
RV74	146.1375	146.7375	
RV75	146.1500	146.7500	
RV76	146.1625	146.7625	
RV77	146.1750	146.7750	
RV78	146.1875	146.7875	
RV79	146.2000	146.8000	
RV80	146.2125	146.8125	
RV81	146.2250	146.8250	
RV82	146.2375	146.8375	
RV83	146.2500	146.8500	

CHANNEL NO.	FREQUENCY (MHz)		NOTE
	Transmit (Tx)	Receive (Rx)	
RV84	146.2625	146.8625	**Frequecy Band:** 146 MHz to 146.4 MHz/146.6 MHz to 147.0 MHz: **Channeling Plan** to be used for a repeater station (Tx/Rx separation = 0.6 MHz & channel bandwidth = 12.5 kHz)
RV85	146.2750	146.8750	
RV86	146.2875	146.8875	
RV87	146.3000	146.9000	
RV88	146.3125	146.9125	
RV89	146.3250	146.9250	
RV90	146.3375	146.9375	
RV91	146.3500	146.9500	
RV92	146.3625	146.9625	
RV93	146.3750	146.9750	
RV94	146.3875	146.9875	
	146.4000	147.0000	
RV95	147.0000	147.6000	**Frequecy Band:** 147 MHz to 147.4 MHz/147.6 MHz to 148.0 MHz: **Channeling Plan** to be used for a repeater station (Tx/Rx separation = 0.6 MHz & channel bandwidth = 12.5 kHz)
RV96	147.0125	147.6125	
RV97	147.0250	147.6250	
RV98	147.0375	147.6375	
RV99	147.0500	147.6500	
RV100	147.0625	147.6625	
RV101	147.0750	147.6750	
RV102	147.0875	147.6875	
RV103	147.1000	147.7000	
RV104	147.1125	147.7125	
RV105	147.1250	147.7250	
RV106	147.1375	147.7375	

Channelised Band Plan 144.0000 to 148.0000 MHz (4/4)

CHANNEL NO.	FREQUENCY (MHz)		NOTE
	Transmit (Tx)	Receive (Rx)	
RV107	147.1500	147.7500	**Frequecy Band:** 147 MHz to 147.4 MHz/147.6 MHz to 148.0 MHz: **Channeling Plan** to be used for a repeater station (Tx/Rx separation = 0.6 MHz & channel bandwidth = 12.5 kHz)
RV108	147.1625	147.7625	
RV109	147.1750	147.7750	
RV110	147.1875	147.7875	
RV111	147.2000	147.8000	
RV112	147.2125	147.8125	
RV113	147.2250	147.8250	
RV114	147.2375	147.8375	
RV115	147.2500	147.8500	
RV116	147.2625	147.8625	
RV117	147.2750	147.8750	
RV118	147.2875	147.8875	
RV119	147.3000	147.9000	
RV120	147.3125	147.9125	
RV121	147.3250	147.9250	
RV122	147.3375	147.9375	
RV123	147.3500	147.9500	
RV124	147.3625	147.9625	
RV125	147.3750	147.9750	
RV126	147.3875	147.9875	

CHANNEL NO.	FREQUENCY (MHz)		NOTE
	Transmit (Tx)	Receive (Rx)	
V64	147.435		**Frequency Band**: 147.4 MHz to 147.6 MHz **Simplex System** & Channel bandwidth = 30 kHz.
V65	147.465		
V66	147.495		
V67	147.525		
V68	147.555		
V69	147.585		

Note :

The channel number proposed is commonly being practice by international and local Radio Amateur Society.

Appendix C

Conditions of AA

The issuance of the AA in the frequency band 144 MHz to 148 MHz shall be subject to the following conditions:

(a) An amateur repeater station is to be erected on site belonging to telecommunication companies, on the roof top of high rise building or on hill tops with proper permission from the relevant authority. In the case of roof tops of high rise building or hill tops, it is the responsibility of the assignment holder to ensure safety of the towers, antenna set-up and equipment from lighting strike, harmful interferences and possible damage to properties or threatening the life of humans and animals.

(b) It is also the responsibility of the assignment holder to ensure that under the agreement with the telecommunication company, the relevant government authority or owner of the high-rise building for the usage of the site, to include a clause for the rights of the Commission to inspect the sites at any time deem appropriate by the Commission.

(c) The assignment holder will be required to furnish transportation such as four wheel drive vehicles for such inspections to be carried out by the Commission. All expenses incidental to such inspections by the Commission is to be borne by the assignment holder.

(d) Amateur repeater stations are required to be capable of input and output encoding/ decoding in CTSS. The equipment should also be capable of remote start-up and shut-down using DTMF.

(e) The frequency separation for amateur repeater is 600 kilohertz. It is best practise to use duplexers for separation. Where such equipment is not being used, the assignment holder is required to frequently check (at least quarterly), the repeater equipment for harmful interference. The Commission encourages the use of digital technology in amateur repeater operations.

(f) Any amateur assignment holder is allowed to send messages through an amateur repeater station or a network of amateur repeaters linked together. Amateur repeater station assignment holders cannot restrict the use of their repeaters to their members only. In the spirit of amateur goodwill, the Commission encourages the use of Bahasa Malaysia and English as the medium of language for transmitting messages over an amateur repeater frequency. It is considered best practise to limit messages in other languages on simplex frequencies.

(g) Amateur beacons are permitted to transmit a one-minute message every 10 minutes, 24 hours a day. Each amateur beacon is permitted to transmit in CW mode, messages of a 1 minute time slot once every minute in a specific frequency. The message and power level are as shown in Table 1 below. The same sequence is required to be repeated every 10 minutes.

(h) Equipment capable of multiple band operation is permitted for amateur beacon operations, provided for each assigned frequency the condition in paragraph (1) above is complied with.

(i) In order for frequency-sharing to work on an international basis, the amateur beacon assignment holder is required to liaise with IARU to know precisely when is the time for the beacon to start transmitting the sequence of messages as shown in Table 1 below.

(j) A 3 seconds of "guard time" is required to be maintained between one beacon's transmission and the next on the same frequency to avoid an overlap with that of a neighboring amateur beacon in another country.

(k) Where crystals are used for timing control, it is necessary to reset each beacon's internal clock every four to six weeks to avoid overlap with another beacon's transmission. In this respect, the Commission encourages the use of GPS timing solution.

Table 1
Transmissions by Each Beacon

Power level (Watts)	CW Message
100	QST de (call sign)
100	. _____ (9-second dash)
10	. . _____ (9-second dash)
1	. . . _____ (9-second dash)
0.1	. . . . _____ (9-second dash)
100	SK (call sign)
Notation	
Total transmission time	57 seconds
CW speed	22 wpm

Appendix D

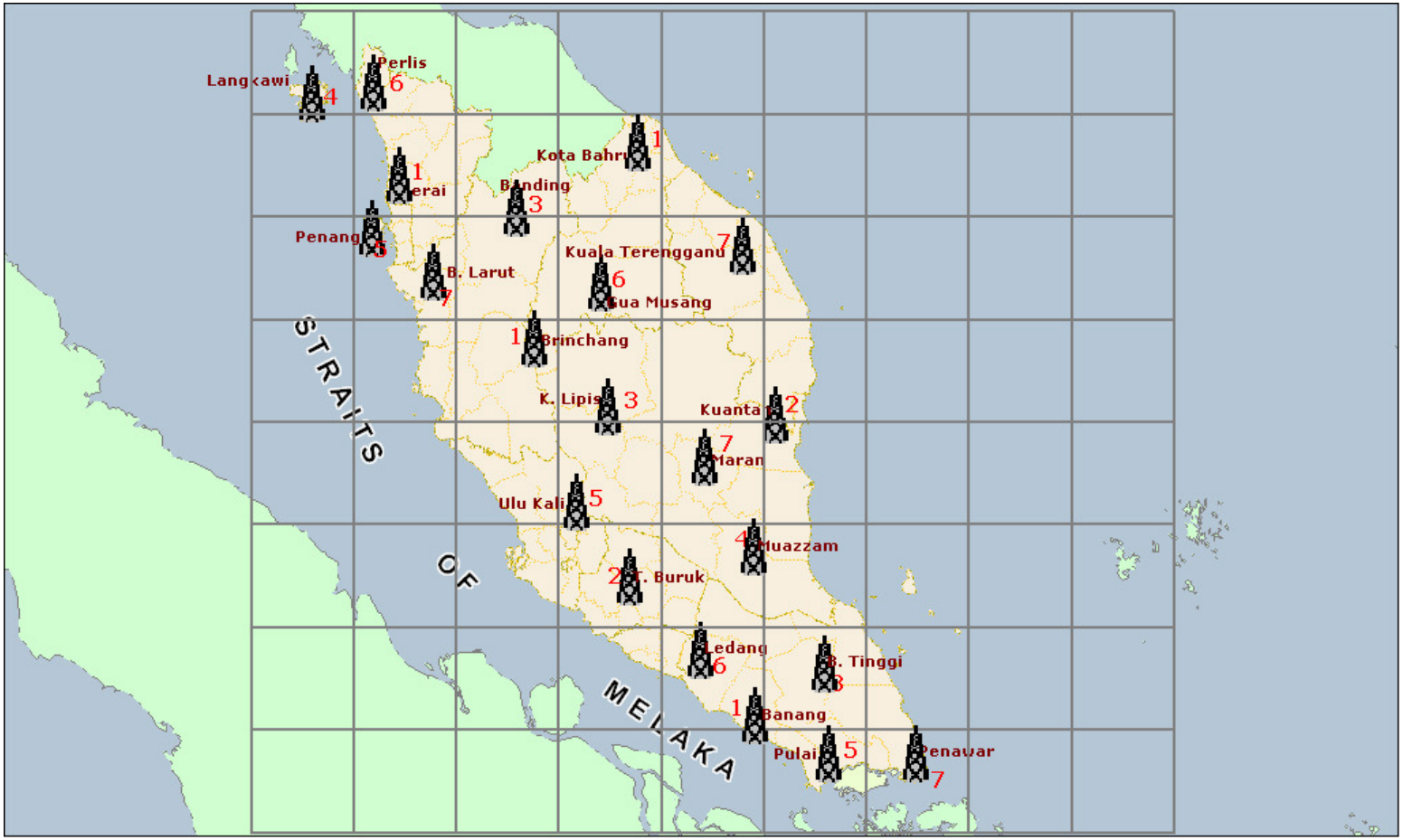
GROUP #1											
BLOCK 1: 145.00 - 145.20 MHz / 145.60 MHz - 145.80 MHz CHANNEL NUMBER					BLOCK 2: 146.00 MHz - 146.40 MHz / 146.60 MHz - 147.00 MHz CHANNEL NUMBER						
RV48	RV53	RV58	RV63		RV64	RV69	RV74	RV79	RV84	RV89	RV94
145.0000	145.0625	145.1250	145.1875		146.0125	146.0750	146.1375	146.2000	146.2625	146.3250	146.3875
145.6000	145.6625	145.7250	145.7875		146.6125	146.6750	146.7375	146.8000	146.8625	146.9250	146.9875
GROUP #2											
BLOCK 1: 145.00 - 145.20 MHz / 145.60 MHz - 145.80 MHz CHANNEL NUMBER					BLOCK 2: 146.00 MHz - 146.40 MHz / 146.60 MHz - 147.00 MHz CHANNEL NUMBER						
RV49	RV54	RV59			RV65	RV70	RV75	RV80	RV85	RV90	
145.0125	145.0750	145.1375			146.025	146.0875	146.1500	146.2125	146.2750	146.3375	
145.6125	145.6750	145.7375			146.625	146.6875	146.7500	146.8125	146.8750	146.9375	
GROUP #3											
BLOCK 1: 145.00 - 145.20 MHz / 145.60 MHz - 145.80 MHz CHANNEL NUMBER					BLOCK 2: 146.00 MHz - 146.40 MHz / 146.60 MHz - 147.00 MHz CHANNEL NUMBER						
RV50	RV55	RV60			RV66	RV71	RV76	RV81	RV86	RV91	
145.0250	145.0875	145.1500			146.0375	146.1000	146.1625	146.2250	146.2875	146.3500	
145.6250	145.6875	145.7500			146.6375	146.7000	146.7625	146.8250	146.8875	146.9500	
GROUP #4											
BLOCK 1: 145.00 - 145.20 MHz / 145.60 MHz - 145.80 MHz CHANNEL NUMBER					BLOCK 2: 146.00 MHz - 146.40 MHz / 146.60 MHz - 147.00 MHz CHANNEL NUMBER						
RV51	RV56	RV61			RV67	RV72	RV77	RV82	RV87	RV92	
145.0375	145.1000	145.1625			146.0500	146.1125	146.1750	146.2375	146.3000	146.3625	
145.6375	145.7000	145.7625			146.6500	146.7125	146.7750	146.8375	146.9000	146.9625	
GROUP #5											
BLOCK 1: 145.00 - 145.20 MHz / 145.60 MHz - 145.80 MHz CHANNEL NUMBER					BLOCK 2: 146.00 MHz - 146.40 MHz / 146.60 MHz - 147.00 MHz CHANNEL NUMBER						
RV52	RV57	RV62			RV68	RV73	RV78	RV83	RV88	RV93	
145.0500	145.1125	145.1750			146.0625	146.1250	146.1875	146.2500	146.3125	146.3750	
145.6500	145.7125	145.7750			146.6625	146.7250	146.7875	146.8500	146.9125	146.9750	

Appendix D
(Continue)

GROUP #1 (Continue)						
BLOCK 3: 147.00 MHz - 147.40 MHz / 147.60 MHz - 148.00 MHz CHANNEL NUMBER						
RV95	RV100	RV105	RV110	RV115	RV120	RV125
147.0000	147.0625	147.1250	147.1875	147.2500	147.3125	147.3750
147.6000	147.6625	147.7250	147.7875	147.8500	147.9125	147.9750
GROUP #2 (Continue)						
BLOCK 3: 147.00 MHz - 147.40 MHz / 147.60 MHz - 148.00 MHz CHANNEL NUMBER						
RV96	RV101	RV106	RV111	RV116	RV121	RV126
147.0125	147.0750	147.1375	147.2000	147.2625	147.3250	147.3875
147.6125	147.6750	147.7375	147.8000	147.8625	147.9250	147.9875
GROUP #3 (Continue)						
BLOCK 3: 147.00 MHz - 147.40 MHz / 147.60 MHz - 148.00 MHz CHANNEL NUMBER						
RV97	RV102	RV107	RV112	RV117	RV122	
147.0250	147.0875	147.1500	147.2125	147.2750	147.3375	
147.6250	147.6875	147.7500	147.8125	147.8750	147.9375	
GROUP #4 (Continue)						
BLOCK 3: 147.00 MHz - 147.40 MHz / 147.60 MHz - 148.00 MHz CHANNEL NUMBER						
RV98	RV103	RV108	RV113	RV118	RV123	
147.0375	147.1000	147.1625	147.2250	147.2875	147.3500	
147.6375	147.7000	147.7625	147.8250	147.8875	147.9500	
GROUP #5 (Continue)						
BLOCK 3: 147.00 MHz - 147.40 MHz / 147.60 MHz - 148.00 MHz CHANNEL NUMBER						
RV99	RV104	RV109	RV114	RV119	RV124	
147.0500	147.1125	147.1750	147.2375	147.3000	147.3625	
147.6500	147.7125	147.7750	147.8375	147.9000	147.9625	

Appendix E

Proposed Location of Amateur Repeater Station (Peninsula Malaysia)



Proposed Location of Amateur Repeater Station (Sabah & Sarawak)