



SURUHANJAYA KOMUNIKASI DAN MULTIMEDIA MALAYSIA
Malaysian Communications and Multimedia Commission

AMATEUR RADIO COMMUNICATIONS

GUIDELINES FOR AMATEUR RADIO SERVICES IN MALAYSIA

Second Edition
01March2012

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Notice:

The information contained in this document is intended as a guide only. For this reason it should not be relied on as legal advice or regarded as a substitute for legal advice in individual cases. Parties should still refer to the legislative provisions contained in the law.

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GLOSSARY

Callsign	A series of letters and numbers used to identify a station and the country they are operating from
Carrier	The un-modulated output of a radio transmitter
Continuous Wave	The output of a radio transmitter that can be switched on and off to generate Morse code signals
Frequency Modulation	A modulating technique that varies the carrier frequency of the transmitter in accordance with the variations in the strength of the modulating audio signal.
Hams	Nickname for an amateur radio operator
High Frequency	Frequencies ranging from 3MHz to 30MHz although the amateur "top band" on 1.8MHz is generally considered to be part of the HF allocation.
Modulation	The process of changing the output carrier of a transmitter in order to convey information such as telephony.
"Q" Code	The universal radio language used to make communication simpler by using three character codes such as QSL, QRZ, QSB and etc.
Repeater	An unmanned station that receives signals on a certain frequency and simultaneously retransmits them on another.
Short Wave	Frequencies in the HF range of 3MHz to 30MHz
Transceiver	A combined receiver and transmitter in one unit.
Ultra High Frequency	The frequency range from 300MHz to 3,000MHz
Very High Frequency	The frequency range from 30MHz to 300MHz

ABBREVIATION

AA	Apparatus Assignment
AROC	Amateur Radio Operator's Certificate
ARS	Amateur Radio Services
ASAA	Amateur Station Apparatus Assignment
AOP	Amateur Operating Procedures
CB	Citizen Band
CW	Continuous Wave
EMC	Electromagnetic Compatibility
FM	Frequency Modulation
GMT	Greenwich Mean Time
HF	High Frequency
IF	Intermediate Frequency
ITU	International Telecommunication Union
RAE	Radio Amateur Examination
RF	Radio Frequency
SRSP	Standard Radio System Plan
SW	Short Wave
SWL	Short Wave Listener
UHF	Ultra High Frequency
UTC	Universal Time (UTC is also known as GMT)
VHF	Very High Frequency

MALAYSIAN COMMUNICATIONS AND MULTIMEDIA COMMISSION
GUIDELINES FOR AMATEUR RADIO SERVICES IN MALAYSIA

GENERAL

This document is developed by the Malaysian Communications and Multimedia Commission (SKMM) as a guide for:

- a) the candidates who intended to sit for the Radio Amateur Examination in order to operate a station in the band for radio amateur services;
- b) the amateur radio operators who intended to operate an amateur radio stations in Malaysia.

This document is divided into three main parts:

- a) Part A: How to become a radio amateur operator in Malaysia;
- b) Part B: Amateur Radio Operating Procedure; and
- c) Part C: Radio Amateur Examination Syllabus.

PART A: HOW TO BECOME A RADIO AMATEUR OPERATOR IN MALAYSIA

Introduction

Amateur Radio Service exists in nearly every country and utilizes the same frequencies as in Malaysia. In Malaysia, the amateur radio is regulated by the Malaysian Communications and Multimedia Commission (SKMM). To operate an amateur radio station in Malaysia, the operator must have an Amateur Radio Operator's Certificate and an Amateur Station Apparatus Assignment (ASAA) or a foreign amateur radio licensed from countries that have a reciprocal arrangement with Malaysia. Please refer to Appendix 8 to obtain the list of countries that have a reciprocal arrangement with Malaysia.

About Amateur Radio

Amateur radio service is defined in the Communications and Multimedia (Spectrum) Regulations 2000 as *"a radio communications service (covering both terrestrial and satellite) in which a station is used for the purpose of self-training, intercommunication and technical investigations carried out by authorized persons who are interested in radio technique solely with a personal aim and without any pecuniary interest"*.

Millions of amateurs' radios communicate daily with each other directly or through relay systems and amateur satellites. Amateur service may provide alternative for emergency communication in time of natural disasters. Radio amateur communication able to provide support communication during a disaster where commercial communications system is unavailable, due to the uncomplicated deployment of an amateur radio station.

Radio amateur has been recognized as an important part of the radio community. ITU has allocated common frequency bands for amateur radio service internationally on a sharing basis to all amateur radio stations around the globe.

Things That You Can Do With Amateur Radio

Amateur radio operators are often called "ham radio operators" or "hams". Activities that amateur radio operators can do with their radios are diverse. The following are examples of the activities carried out by hams:-

- a) Communicate around the world. With HF radio, hams can talk to each other at any part of the globe.
- b) Converse around town. With small portable VHF or UHF transceivers, hams can enjoy wireless communications within their local community.
- c) Help in emergencies and natural disasters situations by providing immediate communications whenever normal communications service is failed or unavailable.
- d) Build own radio, transmitter, receiver and antenna.

- e) Communicate through amateur satellites. Ham can use amateur satellites operated by the amateur community without any cost.
- f) Communicate with astronaut while they orbiting the earth.
- g) Experimental with Amateur TV (ATV), Slow-Scan TV (SSTV), or send still-frame pictures.
- h) Participate in “transmitter hunt games” or “Fox Hunt” or maybe build their own directional finding equipment.
- i) Participate in the search and rescue activities by providing communication required.

Things That Are Not Allowed To Do With Amateur Radio

Specifically, there are few things that amateur radio operators are not allowed to do:

- a) Amateur radio operators are not allowed to do anything with their radios that can generate financial income.
- b) Amateur radio operators are prohibited from broadcasting to the public. The amateur radio transmission is meant to be received by other amateur radio operators/stations only.
- c) Amateur radio services shall not be used for the expansion of business, religion and politics.

Getting Started

You can start your hobby in amateur radio by joining a local amateur radio club. Clubs can provide information about licensing in their respective area, local operating practices and technical advice.

In Malaysia, amateurs are required to pass an examination to demonstrate technical knowledge, operating competence and awareness of legal and regulatory requirements in order to avoid interference with other amateurs and other radio services. There are two types of exams available. Passing in the examination entitled you to apply for the Amateur Station Apparatus Assignment (ASAA) or in general you can call it as Amateur Radio License (license).

If your ASAA application is approved, SKMM will issue a callsign with “9W” or “9M” prefix depending on your eligible operating class. This callsign is unique to amateur radio operator. You must use it on the air to legally identify your amateur station during any and all radio communication. The entry level to obtain the ASAA (or in general it's call as the Amateur License) is ASAA Class B (“9W” prefix). You must operate on Class B for at least one year before eligible to upgrade your license to Class A (“9M” prefix).

Privileges of the Amateur

In contrast to most commercial and personal radio services, radio amateur operators are not restricted to use type approved equipment, and therefore some radio amateur equipment are home constructed or modified equipment in any way, so long as they meet all the technical requirement such as its operating frequency, power level, classes of emission and the national and international standards on spurious emissions.

SKMM has published an Authorization Notice pursuant to Regulation 16(2) of the Communications and Multimedia (Technical Standards) Regulations 2000 to authorise a person who holds an Amateur Station Apparatus Assignment (ASAA) for either Class A or Class B, to import and use any amateur radio equipment listed in the notice without a need to obtain Type Approved or Compliance Certificates from SIRIMQAS International Sdn. Bhd. (SQASI). Importation of amateur radio equipment listed in the notice only requires an Import Permit from SQASI. You can obtain the notice from our official website at www.skmm.gov.my.

For amateur radio equipment which is not included in the notice, importation of such equipment is subjected to Certification or Type Approval (compliance approval). The equipment must have a proper certificate or compliance approval issued by SQASI before it is eligible to be considered for the issuance of its import permit. To be certified, the equipment must comply with all of the requirements stated in the Technical Specifications for Amateur Radio Equipment (Document SKMM WTS ARE, Rev. 1.01:2007) which is also available on our official website.

Amateurs who wish to include other amateur radio equipment in addition to those listed in the current notice may submit printed copies of the amateur radio equipment brochures/catalogues with detail technical specifications such as but not limited to its frequency ranges, output power, emission mode, modulation type, frequency stability, spurious emission and receiver sensitivity to SKMM. Please send your submission to the Director of the Industry Development and Standards Division. Only equipment that complies with the technical specification will be approved.

Spectrum Plan and Frequency Allocations

In Malaysia, SKMM has the overall responsibility for managing radio frequency spectrum under the Communication and Multimedia Act 1998 (CMA98). Among other responsibilities of the SKMM include the task of developing a spectrum plan in respect of all or any part of the spectrum. The CMA98, as the main legislation which regulates the communications and multimedia industries, also sets out the national policy objectives for the development of the communications industries.

The Spectrum Plan will provide a guide on how the spectrum is currently used and how the SKMM plans to develop it further in the near future. The technological convergence of telecommunications, broadcasting and information technology means that management of the spectrum has become an even more complex issue. The main challenge is how SKMM are to manage this finite resource in the

best manner possible and to ensure that it is utilised efficiently to fulfil the society's needs and the demands of the technology.

More details on the Spectrum Plan are available at SKMM official website for free access and download.

Band Plan

In general, a band plan is a plan for using a particular band of radio frequencies that are a portion of the electromagnetic spectrum. Each band plan defines the frequency range to be included, how channels are to be defined, and what will be carried on in those channels.

A band plan with regards to Amateur Radio service in Malaysia is voluntary plans established by SKMM to manage the use of a particular radio frequency band assigned (sharing basis) for amateur radio services, to be use in harmonize among all of the amateurs. It defines the frequency range to be included, how channels are arranged and what will be carried on those channels. The band plan is designed to maximize the utilization, minimize interference and optimize the usage of the band. In short, band plan is a better way to organize the use of allocated bands efficiently.

Standard Radio System Plan (SRSP)

SKMM has also developed a series of documents that is part of the spectrum plan to provide guidance on efficient spectrum usage namely **Standard Radio System Plan (SRSP)**. It is designed to provide information on the minimum requirements in the use of the frequency band as described in the Spectrum Plan. It provides information on technical characteristics of radio systems, channelling of frequencies and coordination initiatives.

For example the SRSP "**MCMCSRSP 536 AS**" states the requirements for the utilization of the frequency band 144 MHz to 148 MHz for Amateur Service in Malaysia. This SRSP covers the minimum key characteristics considered necessary in order to make the best use of the available frequencies. You can access and download the document from our official website. Sample Band Plan for the above band is shown on Appendix 13.

Amateur Radio Operator's Certificate (AROC)

Regulation 27(1) of the Communications and Multimedia (Technical Standards) Regulations 2000 states that ***no person shall undertake or conduct any activity in designated skill area unless that person is certified.*** Amateur radio operator has been gazetted as a designated skill area category under this regulation; hence to operate an amateur radio station, a person needs to have an appropriate proficiency and skill i.e. certified in this area.

The certification (AROC) is necessary to prove that the radio amateur operators have good knowledge of the subject and able to operate an amateur radio station in the correct and responsible manner required by the law.

There are two class of AROC available.

- a) Amateur Radio Operator's Certificate - Class A (AROC Class A)
- b) Amateur Radio Operator's Certificate - Class B (AROC Class B)

Amateur Radio Operator's Certificate (AROC) Class A

The **AROC class A** allows the holder to apply for **ASAA class A**. To be eligible for the AROC class A, the persons must pass the written theory test commonly known as RAE and practical test commonly known as Morse Code Test or CW Test.

Amateur Radio Operator's Certificate (AROC) Class B

The **AROC Class B** only permits the holder to apply for **ASAA class B**. To be eligible for this certificate the persons are only required to pass the RAE.

How to Participate In Amateur Radio

To operate an amateur radio station, the operator must hold the ASAA issued by the SKMM. Application can be applied from any SKMM regional offices. A "**callsign**" will be issued to the successful applicant according to their AROC class.

For details about callsign issuance, please refer to document titled "**Guideline on the Allocation of Callsign to the Amateur Radio Service**" published by the SKMM.

Amateur Station Apparatus Assignment

All amateur radio operators in Malaysia must be licensed by getting the ASAA from SKMM. You need to obtain an ASAA to operate an amateur radio station. The ASAA authorized the holder to participate and operate the amateur radio station.

There are 3 types of ASAA under Amateur Radio category:

- a) Amateur Station Apparatus Assignment (Class A);
- b) Amateur Station Apparatus Assignment (Class B); and
- c) Amateur Repeater Station

To apply for an ASAA the applicant has to fill in the following forms.

- a) Application for Apparatus Assignment(s) (Amateur Service) form for ASAA (Class A & B); or
- b) Application for Apparatus Assignment(s) (Mobile Service) form for Amateur Repeater Station.

The validity period for ASAA is between three months to five years. Sample of the form is shown in Appendix 11. Please refer to “**Guideline for Apparatus Assignment**” published by the SKMM for details.

Eligibility for ASAA Application

To be eligible for ASAA application, applicants must meet the following conditions.

- a) Over 14 years of age for ASAA Class B and 18 years and above for ASAA Class A. Applicants under 21 years will be required to present consent from their parent, guardian or any other approved person who shall be responsible for the observance of the conditions of the applicants to countersigned their application.
- b) A Malaysian citizens or citizens of countries who have a reciprocal arrangement with our country. Please refer to **Appendix 8** for the list of the countries.
- c) Passed the Radio Amateur Examination (RAE) conducted by SKMM for ASAA Class B and passed the Morse Code (CW) test conducted by SKMM and hold the ASAA Class B for at least one year for ASAA Class A application.

Detailed requirements to apply for the ASAA are described in “**Guideline for Apparatus Assignment**” published by the SKMM.

Compliance Requirement

The ASAA holder shall comply with the relevant provisions of the Communications and Multimedia Act 1998 (CMA98) and its subsidiary legislations or any amendments made thereof.

International Compliance Requirement

The ASAA holder shall comply with the relevant provisions of the Radio Regulations of the ITU and International Telecommunication Convention.

The usage of frequencies for repeater stations operating VHF and UHF bands within 50 kilometres of the Malaysian border will require border coordination with the neighbouring countries for a mutual arrangement between Malaysia and the neighbouring country.

Fee for Apparatus Assignment Amateur Station

The fees for the ASAA are tabled as below.

Assignment Type	Application Fee	Annual Fee
ASAA Class A	RM 60.00	RM 36.00
ASAA Class B	RM 60.00	RM 24.00
Amateur Radio Repeater Station	RM 60.00	RM 60.00

International Licensing and Operation

When traveling abroad, the visitor must hold a reciprocal license with the country in which she or he wishes to operate. Reciprocal licensing requirements vary from country to country. Some countries have bilateral or multilateral reciprocal operating agreements allowing hams to operate within their borders with a single set of requirements.

Reciprocal Operating Arrangement

Foreign amateur radio operator may apply for ASAA under the reciprocal arrangement between their country and Malaysia. SKMM may issue an ASAA to the foreign amateur radio operator if they meet all the requirements. The class of the ASAA issued will be equivalent to the license class or assignment issued by their home country authority in their original home country. Please refer to Appendix 8 for the list of the countries which have a reciprocal arrangement with Malaysia.

The ASAA will not be issued for a period of more than the validity of the home country license or one year whichever is earlier.

Foreign amateur radio operator from country which has no reciprocal arrangement will be dealt on a case by case basis. However an introduction from a member of MARTS will be preferred.

The Examination

There are two types of examination pertaining to amateur radio:

- a) Radio Amateur Examination (RAE); and
- b) Morse Codes Test (CW Test).

Both examinations are conducted by the SKMM.

Radio Amateur Examination (RAE)

The RAE is a written examination on the following topics:

- a) The fundamental theory of electricity, electronics and radio communications;

- b) The theory and operation of any amateur radio equipment including the antenna systems, transmission lines, transistors, amplitude and frequency modulation and single sideband techniques;
- c) The regulations made under the Act which is applicable to the establishment and operation of a station performing an amateur experimental service; and
- d) The ITU Radio Regulations applicable to the operation of a station performing an amateur experimental service and those provisions relating to the operation of stations generally.

The RAE comprises 100 objective questions with four optional answers. Candidates are given three hours to answer all questions. The question is in bi-language i.e. English and “Bahasa Melayu”.

Passing mark for the RAE is 50%. No marks are deducted for a wrong answer.

The structure of the question is as shown in the following table.

No.	Topics / Syllabus	No. of Questions
1.	Regulation and Licensing Conditions	20
2.	Good Practices and Operating Procedures	30
3.	The fundamental theory of electricity, electronics and radio communications	50

Please refer to **Part C** for the details syllabus.

Morse code Test

The Morse Code (CW) test is a practical test that measure skill of the following proficiencies;

- a) An ability to send message correctly on a radiotelegraph key, semi-automatic key or an electronic hand key for three consecutive minutes at a speed of not less than 12 words per minute in plain language, including figures, punctuation marks, “Q” signals and emergency signals in the international Morse Codes; and
- b) An ability to receive message correctly by ear and write legibly or type for not less than three consecutive minutes at a speed of not less than 12 words a minute in plain language including figures, punctuation marks, “Q” signals and emergency signals in the international Morse Codes.

In CW sending tests, applicant must be able to send 36 words (averaging five letters per word) in plain language within three minutes or equivalent to a speed of 12 words per minute without uncorrected error. A maximum of four

errors as well as four corrections are allowed. In sending figures, 10 five-figure groups are to be sent in 1.5 minutes without uncorrected error. A maximum of two corrections are allowed.

In CW receiving tests, applicant is required to receive 36 words (averaging five letters per word) in plain language in three minutes, and 10 five-figure groups in 1.5 minutes. Each letter or figure incorrectly received counts as one error. A word in which more than one letter is incorrectly received counts as two errors. A maximum of four errors in plain language and a maximum of two errors in the figure test are allowed.

The tests will not include any punctuation or other symbols except for full stops, commas, oblique strokes, question marks and error symbols. The foregoing particulars are summarized in the following:

Type	No of words or groups	Test Duration	Sending		Receiving
			Max no of corrections	Max no of uncorrected errors	Max no of errors
Plain Language	36 words	3 min	4	0	4
Figures	10 five-figure group	1.5 min	2	0	2

How to Apply for the Examination

The examination will be held from time to time. The actual date and venue for the examination will be specified by the SKMM. The notice or announcement will be made through a public notice, published in the local press and SKMM official website at www.skmm.gov.my. The notice will have detailed terms and conditions, application procedures, payment mode and other related matters pertaining to the examination.

In the RAE conducted on 15 December 2011, SKMM has introduce a new web based application to manage the examination conducted by SKMM namely SKMM Examination Management System or in short SEMS. Details of the system are described below.

In case you need more information or having questions with regards to SEMS, you may email us at sems@cmc.gov.my

For manual application, sample of the application form is shown in Appendix 9 and available at SKMM head office and its regional offices. Contact details of all the SKMM offices are listed in Appendix 14.

Examination fee

The fee for the examinations are as followed.

Examinations	Application Fees
Radio Amateur Examination (RAE)	RM 50.00
Morse Code Test	RM 50.00

The examination fee is not refundable to any candidates who withdraw from or fail to attend the examination. The fee cannot be transferred from one examination to another at a later date or from one candidate to another.

For online application, you have to purchase an examination voucher to begin your application. You can only purchase one (1) voucher at a time. Your voucher is valid for up to one year. Please refer to the voucher validity table on SEMS Guide section of this document to determine your voucher validity period.

Minimum Age Requirement for the Examination

The minimum age limit for candidate to sit for the examination is 14 years for the RAE and 18 years for the CW Test. This is due to take into consideration of the responsibility required to operate a higher power transmission and privileges accorded to a Class A amateur station operator.

SKMM Examination Management System (SEMS)



What is SEMS?

SEMS is an acronym for SKMM Examination Management System. It is an online web based application that enables you to submit your application to sit for the examinations conducted by SKMM which are Amateur Radio Examination (RAE) and Morse Code Test (CW) through electronic means. The system also provides various functions that include application status checking, exam result checking and other useful functions that suit your needs in managing your application process with ease.

SEMS comprised two main modules which are:

- a) Online registration (application to sit the RAE and CW); and
- b) Online Assessment (for RAE only).

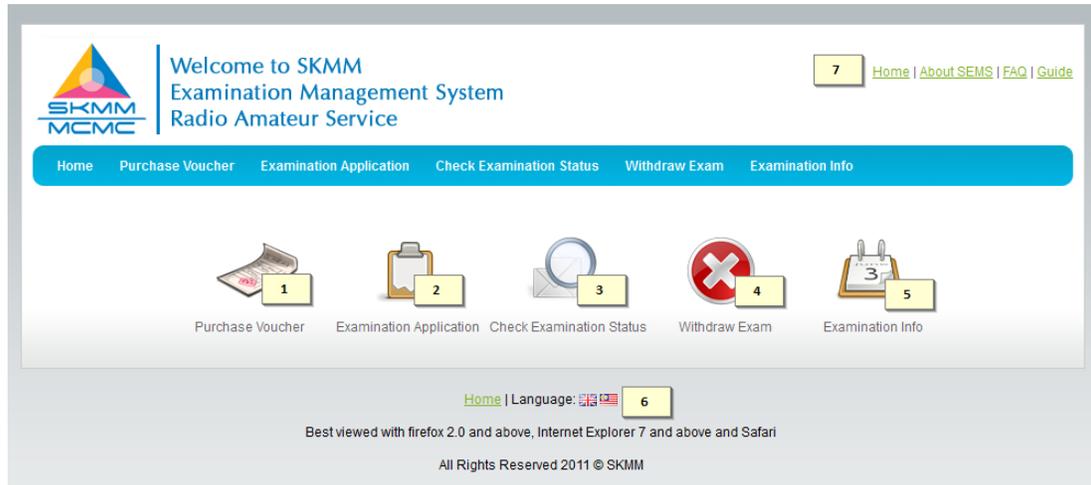
The online registration module is open to public since the second series of the RAE for the year 2011 (RAE 2011-2), conducted on 15 December 2011. As for online assessment module, it is expected to be ready and introduce to public by end of 2012.

To access and experience the system, please visit the SKMM official web page at www.skmm.gov.my or direct to URL <http://sems.skmm.gov.my>. For more information or questions, email us at sems@cmc.gov.my

The following is a brief SEMS user guide for your reference. This user guide is also available from its official web page.

SEMS GUIDE

Button and Links



- 1: Need to apply examination online? You can purchase your examination voucher through SKMM's online payment system.
- 2: RAE or CW? Apply and submit your application here, online. Be paperless, be green.
- 3: Need to check your application status or even your examination result status? Check your examination status here.
- 4: Want to give it a second thought? Withdraw your examination application in just a second! Just click the button.
- 5: Want to know the latest information of the current available exam? Get it here.
- 6: Choose your preferred language here.
- 7: Quick link to visit other available pages.

Where to Begin?



Check the Examination Information

Here, you will be able to view any available exam that is currently active and open for application.

Welcome to SKMM
Examination Management System
Radio Amateur Service

[Home](#) | [About Amature Radio Service](#) | [FAQ](#) | [Guide](#)

Home Purchase Voucher Examination Application Check Examination Status Withdraw Exam Examination Info

Examination Info

Examination Series	Examination Type	Exam Date & Time	Application Closing Date	Examination Venue
8	RAE	March 30, 2012 09:00 AM	March 26, 2012	Central Region

OK 1

1: Click **OK** button to redirect back to Home page.



Purchase Examination Voucher

You will be redirected to SKMM E-payment Page.

SKMM
ePayment Portal
Your One Stop Payment Centre

Home Apparatus Assignment Voucher

SKMM ePayment Portal
Your One Stop Payment Centre

Welcome

SKMM e-Payment is a facility enabling online payment to SKMM through FPX and Credit Card.

Apparatus Assignment Voucher

Enter Enter **Click here to purchase voucher**

SKMM ePayment Portal
Your One Stop Payment Centre

Home Apparatus Assignment Voucher

Home > Voucher

Main Menu

- Notice Review
- Service Information
 - Apparatus Assignment
 - Class and Individual License
 - Postal and Courier Service
 - Universal Service Provision Contribution
- Payment Method
 - FPX
 - Credit Card
- Contact Us

SYARAT-SYARAT PERMOHONAN (ATAS TALIAN) BAGI MENDUDUKI PERPERIKSAAN RADIO AMATUR (RAE) & UJIAN KOD MORSE (CW)

- Permohonan mestilah memenuhi kriteria berikut:-
 - Bagi permohonan peperiksaan Radio Amatur (RAE), pemohon mestilah berumur 14 tahun ke atas pada hari peperiksaan tersebut dilangsungkan; dan
 - Warganegara Malaysia, Permaustatin Tetap atau warganegara asing dari negara yang memiliki aturan kesalingan (reciprocity arrangement) dengan Malaysia. Senarai Negara
 - Bagi permohonan Ujian Kod Morse, pemohon mestilah berumur 18 tahun ke atas pada hari peperiksaan tersebut dilangsungkan; dan
 - Memiliki Penguntukan Radas Stesen Amatur Kelas B (9W) yang sah untuk tempoh sekurang-kurangnya satu tahun pada hari ujian tersebut dilangsungkan.
- Bayaran Yuran Peperiksaan termasuk yuran pemrosesan ialah RM50.00 dan hanya boleh dijelaskan melalui penggunaan "Baucer Peperiksaan SKMM" yang boleh dibeli melalui sistem e-payment SKMM.
- Baucer hanya sah digunakan dalam tempoh sahlakunya sahaja untuk permohonan menduduki Peperiksaan anjuran SKMM oleh penama yang tertera pada baucer tersebut. Pastikan anda adalah orang yang layak untuk menduduki ujian tersebut sebelum membeli baucer ini kerana baucer ini tidak boleh ditukar milik atau dikembalikan semula untuk tebus tunai.
- SKMM berhak menentukan tarikh, masa dan tempat peperiksaan muktamad bagi setiap calon.

1 Saya bersetuju dengan terma dan syarat-syarat yang telah dinyatakan diatas

Proceed **2**

- 1: Click at the checkbox to agree the terms and conditions
- 2: Click **Proceed** button. You will be directed to the following page

The screenshot shows the SKMM ePayment Portal interface. At the top left is the SKMM logo with the tagline 'Your One Stop Payment Centre'. The top right has language options for 'Bahasa Melayu' and 'English'. Below the header is a navigation bar with 'Home', 'Apparatus Assignment', and 'Exam Voucher'. A breadcrumb trail shows 'Home > Voucher > Search'. The main content area features a background image of a credit card and a registration form. The form includes a 'Main Menu' sidebar with categories like 'Notice Review', 'Service Information', 'Payment Method', and 'Contact Us'. The registration form fields are: 'Candidate's Full Name' (filled with 'Zakaria Nasir', callout 3), 'IC No / Passport No / Kad Kuasa' (filled with '790527032345', callout 4), 'Nationality' (dropdown menu set to 'Malaysian', callout 5), and 'Country' (dropdown menu set to 'Malaysia', callout 6). A '>Submit' button is labeled with callout 7. A note above the form states '* Payments can be made between 7 am to 11pm daily.' Below the form, it lists accepted payment methods: VISA, MasterCard, MEPS, FPX, CIMB Clicks, CIMB Biz-Channel, Hong Leong Online Personal, Hong Leong Online Business, maybank2u.net, maybank2u.com, BANK ISLAM, RHB Bank, and PS Bank. At the bottom, it specifies 'FPX Operation Hour: 7.00am - 11.00pm Every day'.

- 3: Fill up **Full name**
- 4: Fill up **IC Number, Passport or Authorization Card Number**
- 5: Select **Nationality**
- 6: Select **Country**
- 7: Click **Submit** button

You will be directed to a confirmation page. Here, you will need to select your payment options.

Voucher Payment Options

Candidate's Full Name	IC No / Passport No / Kad Kuasa	Nationality	Country	Expiry Date	Total
Zakaria Nasir	790527032345	Malaysian	Malaysia	06/30/2012	RM50.00

8

9

  (Individual)

  (Corporate)

10

8: Check the details that has been entered

9: Select **Payment** option (Credit Card or FPX)

10: Click **Submit** button

**** Note:** The system will display your selected bank / credit card portal to prepare for the electronic transfer of the payment. Continue the payment process until successfully received your voucher

After successful / completion of your online payment transaction, you will be able to view your transaction information and print your voucher.

Transaction Information

* Please print out the receipt for your reference

Transaction Status : Successful
Transaction Date : Oct 15 2011 1:25PM
Transaction ID. : 145
Authorization ID : 066928 11

Receipt : SEMS/2011/0000045
Voucher No : 11-000021
Candidate's Full Name : Zakaria Nasir
IC No / Passport No / Kad Kuasa : 790527032345
Nationality : Malaysian
Country : Malaysia
Total Amount : RM50.00

12

- 11: Check your transaction details. In case you spot any errors or need further clarification, please contact SKMM.
- 12: Click **Print Voucher** to print out your examination voucher.

BAUCER PEPERIKSAAN

BAUCER PEPERIKSAAN

13 11-000021

**SKMM
MCMC**

BAUCER PEPERIKSAAN SKMM

Nama: Zakaria Nasir
NO. K/P: 790527032345
TARIKH BAUCER: 15 Oct 2011
TARIKH TAMAT: 30 Jun 2012

14

Perhatian: Bucer ini TIDAK boleh ditukar milik dan HANYA sah digunakan untuk permohonan peperiksaan/ujian yang dianjurkan oleh SKMM dan dalam tempoh sah lakunya sahaja. Bucer ini TIDAK boleh ditukar semula kepada wang ringgit dalam apa juga keadaan sekalipun.

- 13: Examination Voucher Number
- 14: Examination Voucher details.

**** Note:**

- i) You can only purchase one (1) voucher at a time. You may purchase another voucher if you have used the existing voucher for an examination.
- ii) Your voucher is valid up to 1 year. You may refer table below to determine your voucher validity period.

Purchased Date	Expiry Date
1 January – 30 June	31 December (the same year it purchased)
1 July – 31 December	30 June (the following year)



Examination Application

To apply for an examination, you will need to follow these steps:

1: Enter Voucher Number or Enter your IC / Passport / “Authorization Card” Number (Use this option if you have lost your voucher slip)

2: Click **CHECK** button to check the status

** **Note:** You will not be able to apply for the examination if:

- i. Your Voucher Number is invalid; or
- ii. You have already registered for the examination

3: Select your preferred Examination Type

4: Check your voucher information details button

- 5: Click **PROCEED** to proceed with your application, or **CANCEL** to go back to the previous page

Examination Series	Exam Date & Time	Application Closing Date	Examination Venue
5	October 20, 2011 9.00 AM	October 14, 2011	6

Voucher No : 11-000021

Applicant's Full Name : Zakaria Nasir

IC/Passport/Kad Kuasa : 790527032345 7

Nationality : Malaysian

Country : Malaysia

Date of Birth : May 27, 1979 8

Age as at Examination Date : 32 9

Gender : Please Choose 10

Address : Desa Mutiara Apartment 11
Jalan PJU 7/15B
Mutiara Damansara

State : Selangor 12

City : Petaling Jaya 13

Postcode : 47800 14

Contact Number : 0173122524 15

E-Mail : karia.nasir@yahoo.com 16

Additional Information - 17

Are you disabled?

If yes, please specify :

Preferred examination center (Region) : Central Region 18

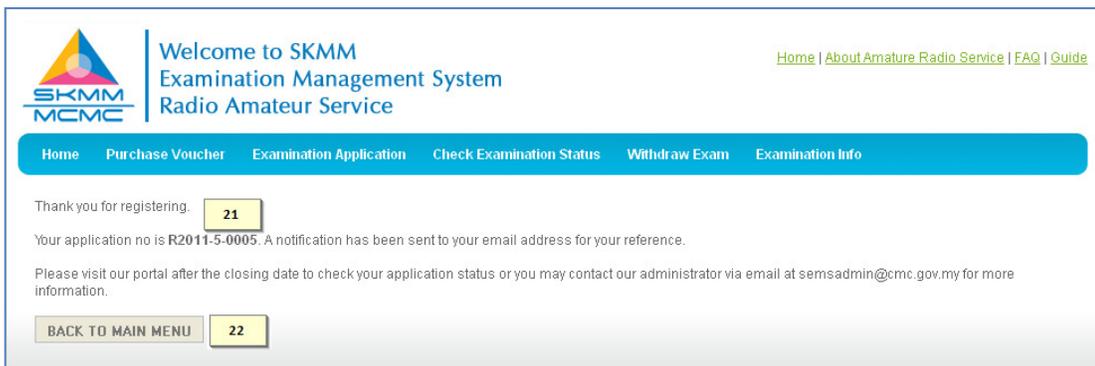
I hereby acknowledge that information submitted here is complete and correct. I also acknowledge that I have read, understand and agreed with the terms and condition specified within this application 19

SUBMIT CANCEL 20

- 6: Examination information
- 7: Applicant's information
- 8: Select **Date of Birth**
- 9: **Age as at Examination Date** will be auto populated from the date of birth entered
- 10: Select your **Gender**
- 11: Enter your mailing **Address**

- 12: Select **State**
- 13: Enter **City**
- 14: Enter **Postcode**
- 15: Enter **Contact No**
- 16: Enter Email Address (optional) – You will received email notification for any status update available
- 17: Enter any **Additional Information**, if available
- 18: Select your **Preferred Examination Center (Region)**
- 19: Click at the checkbox to agree with the terms & conditions
- 20: Click at **SUBMIT** button to proceed or **CANCEL** button to go back to SEMS homepage

**** Note:** If all of your information meets the criteria for the selected exam that you are applying, you will be able to proceed with your application. Please read and understand thoroughly the Rules & Regulations for each exam.



- 21: For successful application, you will prompt with your **Application No**
- 20: Click at **BACK TO MAIN MENU** button to go back to SEMS homepage



Check Examination Status

With SEMS, you will have the ability to check your application status online from SEMS portal. Here, you can check:

i. Examination Application Status

The status update on your examination application will normally take from 2 – 4 weeks after the examination application closing date.

ii. Examination Result

Once the examination result is available, you will also be able to check your exam result, online.

The screenshot shows the SKMM Examination Management System interface. At the top left is the SKMM MCMC logo. To its right, the text reads "Welcome to SKMM Examination Management System Radio Amateur Service". Further right are links for "Home", "About Amature Radio Service", "FAQ", and "Guide". Below this is a blue navigation bar with buttons for "Home", "Purchase Voucher", "Examination Application", "Check Examination Status", "Withdraw Exam", and "Examination Info". The main content area is titled "Check Examination Status" and includes a sub-header with a document icon. Below the sub-header is a text prompt: "Please insert your IC No, Passport or Kad Kuasa No. The system will check the status of your last examination application and your examination result, if made available." There is a text input field containing "790527032345" with a "View Example" link to its right. Below the input field is a "CHECK" button. A yellow box with the number "1" points to the input field, and another yellow box with the number "2" points to the "CHECK" button.

1: Enter your Identification Number (IC / Passport / “Authorization Card”)

2: Click at **CHECK** button to view / check your examination status

Welcome to SKMM Examination Management System Radio Amateur Service

[Home](#) | [About Amateur Radio Service](#) | [FAQ](#) | [Guide](#)

[Home](#) | [Purchase Voucher](#) | [Examination Application](#) | [Check Examination Status](#) | [Withdraw Exam](#) | [Examination Info](#)

Examination Application

Applicant's Full Name : Zakaria Nasir

IC/Passport/Kad Kuasa : 790527032346 **3**

Application No : R2011-5-0005

Examination Application **4**

Status :	Registered
Index No. :	N.A
Examination Type :	RAE
Examination Date & Time :	20 October 2011 , 9.00 AM
Address :	N.A

Examination Result **5**

No Exam Result Available

- 3: Your basic application information will appear here
- 4: **Examination Application:** Status update on your application (REGISTERED, APPROVED / REJECTED).
- 5: **Examination Result:** You will be prompt with your examination result status if it's made available.

The screenshot displays the SKMM Examination Management System interface. At the top, there is a navigation menu with options: Home, Purchase Voucher, Examination Application, Check Examination Status, Withdraw Exam, and Examination Info. The main content area is titled "Examination Application" and shows the following details for an applicant named Zakaria Nasir:

Applicant's Full Name :	Zakaria Nasir
IC/Passport/Kad Kuasa :	790527032345
Application No :	R2011-5-0005

Below this, a section titled "Examination Application" contains a table with the following details:

Status :	Approved
Index No. :	1005
Examination Type :	RAE
Examination Date & Time :	20 October 2011 , 9.00 AM
Address :	Dewan Tunku Abdul Rahman, Tingkat 5, Bangunan CIMB Jalan Tun Perak, Kuala Lumpur, 78978, W.P Kuala Lumpur

There are two callout boxes: a yellow box with the number "6" pointing to the "Approved" status, and another yellow box with the number "7" pointing to a "PRINT EXAM SLIP" button. Below the examination details, there is a section for "Examination Result" which states "No Exam Result Available".

- 6: For all approved application, you will be provided with Examination Center Address detail and you would be able to print out your Examination Admission Slip
- 7: Click at **PRINT ADMISSION SLIP** to print out the examination admission slip



Withdraw Exam

You will also have the option to withdraw your examination application. To do this, you need to understand a few rules and regulations:

- a) You can only withdraw your application before the Application Closing Date
- b) Once you have successfully withdrawn your application, you **WILL NOT BE ABLE** to apply for the same examination again. You can apply for the next examination, provided with your voucher is still valid for use.

Welcome to SKMM
Examination Management System
Radio Amateur Service

Home | About SEMS | FAQ | Guide

Home Purchase Voucher Examination Application Check Examination Status Withdraw Exam Examination Info

Withdraw Application

Please be informed that you can only withdraw your application before the application's closing date. Once withdrawn, you can only apply for the next examination that is available. Please insert your IC No, Passport, Kad Kuasa or your Application No to retrieve your application information.

Application No :

Or

Examination Type : RAE

IC/Passport/Kad Kuasa : [View Example](#)

- 1: Please read the **Withdraw Application** notification
- 2: Insert your Application Number or select your Examination Type & insert your Identification Number
- 3: Click at **CHECK** button to proceed with the withdrawal. A confirmation page will appear and you will be prompt with the information available.

Welcome to SKMM
Examination Management System
Radio Amateur Service

Home | About SEMS | FAQ | Guide

Home Purchase Voucher Examination Application Check Examination Status Withdraw Exam Examination Info

Withdraw Application

Applicant's Full Name : Asraf Omar

IC/Passport/Kad Kuasa : 820722145191

Application No : R2012-2-0003

Examination Type : RAE

Examination Date & Time : 30 March 2012 , 09:00

SKMM-SEMS

Are you sure you want to withdraw your application?

- 4: Your application information will appear here.
- 5: Click at **BACK** button to go back to previous page, or click at **WITHDRAW** button to proceed with your withdrawal.
- 6: A notification of confirmation will be prompt. Click at **OK** button to proceed or **CANCEL** to cancel the process.

PART B: AMATEUR RADIO OPERATING PROCEDURES (AOP)

Introduction

This Amateur Radio Operating Procedures (AOP) is intended to provide guidance for the operation of an amateur radio station. The AOP briefly describes the rules and conditions governing the operation of an amateur radio station in Malaysia.

Display of Apparatus Assignment

The amateur radio operator must adhere to the following rules when setting up the amateur stations.

- a) The ASAA shall be displayed in close proximity of the equipment at the station's address stated in the assignment; and
- b) All mobile stations must carry a copy of the ASAA for proof of identity.

Amateur Radio Station Log Book

The station log book is a book that permanently record of all radio transmission activities, done by the amateur radio operators over a period of time, at the registered address printed on the ASAA. The log book can also be prepared on any electronic medium which can be viewed and reproduced in a hard copy. It should be made available for inspection by any authorized representative from SKMM. The content recorded shall be preserved for a period of at least two years. The station log book should record the following.

- a) The dates of all transmissions;
- b) The time of commencement and ending of every contact made (in local time or in UTC);
- c) The frequency/band used;
- d) The class or mode of transmissions;
- e) The power output;
- f) Callsigns of stations contacted;
- g) The contact name/handle (if available);
- h) Details of tests carried out;
- i) Locations when operations are from any temporary location; and
- j) Serially numbered records.

Inspection of Amateur Radio Station

All amateur radio operators shall permit an authorized officer from SKMM to inspect and test their amateur radio station. SKMM may suspend or cancel any ASAA if the amateur radio station does not comply with the ASAA conditions.

Antennas Setup

Amateur radio operators (ASAA holders) are permitted to erect external or outdoor antennas which shall be structurally safe and shall not pose any danger to the public and any public properties.

Frequency Bands, Power Level and Classes of Emission

The frequency bands, power level and the emission classes for the amateur radio station shall follow the prescribed limits shown in Appendix 1.

Spurious Emission Limits for Amateur Radio Station

Amateur radio operator must ensure that their amateur radio station spurious emissions comply with the ITU requirements on the spurious emission limits for amateur radio stations. The maximum permitted spurious emission power level is calculated by subtracting the following values of "attenuation" from the transmitter power supplied to the antenna transmission line.

Type of service	Attenuation (dB) below the power supplied to the antenna transmission line
Amateur services operating below 30 MHz (including SSB)	43 + 10 log (PEP), or 50 dB, whichever is less stringent
All other amateur services	43 + log (P), or 70 dBc, whichever is less stringent

Where

P = mean power in watts supplied to the antenna transmission line.

PEP = peak envelope power in watts supplied to the antenna transmission line.

Spurious emissions from any part of the installation other than the antenna and its transmission line shall not have an effect greater than what would occur if this antenna system was supplied with the maximum permitted power at that spurious emission frequency.

Installation Procedures for Amateur Radio Station

The following procedures should be followed when established an amateur radio station.

- a) The ASAA holder is permitted to install and operate any of the following amateur radio stations:
 - i) Amateur Radio Base Station – defined as station that is operated as per the address stated in the ASAA;

- ii) Amateur Radio Mobile Station – defined as station that is operated while it is in the moving, such as in the car;
 - iii) Amateur Radio Portable Station – defined as station that is operated away from the registered address in the ASAA for certain duration of time; and
 - iv) Amateur Radio Earth Station – defined as station that working with an amateur radio satellites.
- b) The ASAA holder is permitted to establish more than one station but not allowed to operate at more than one location simultaneously except for the ASAA issued for special event.
- c) A station may be operated at any time provided that no uninterrupted transmission in frequencies below 30 MHz shall exceed 10 minutes, and three minutes for frequencies above 30 MHz.

Operating the Amateur Stations

The amateur radio operators shall adhere to the following.

- a) Upon switching on your amateur radio, the operator is required to listen on the frequency for a momentarily to confirm that the frequency is free. If there are other amateurs using the frequency, the operator may join them by introducing his/hercallsign on that frequency. You can interrupt the conversation during the three-second pause requirement by stating your assigned callsign.
- b) The word “BREAK” should never be used to join a conversation in the progress.
- c) Only use of word “BREAK” or even better “BREAK BREAKBREAK” in emergency of life-threatening situation. Better is to say ”BREAK BREAKBREAK with emergency traffic”
- d) The radio operator should immediately introduce his/her identity by transmitting his/her callsign after calling “BREAK”. All other stations must release the frequency immediately and be on stand-by to assist if necessary.
- e) Radio operators are required to provide a three second pause within the audio message being transmitted as often as possible. At least one occasion of a three second pause should exist in one minute length message.
- f) In Video and data transmission operations, a three second pause within the transmission is not required but a five second pause is essential at the end

of each single transmission. This procedure is vital when messages are transmitted through a repeater, to allow for an interruption to be made if emergency situations that need a message to be transmitted arise.

- g) In simplex operations, amateur radio operator should convey his/her callsign in the initial transmission and at least once in every 10 minutes of transmission period.
- h) In repeater operations, amateur radio operator should convey his/her callsign in the initial transmission and at least once in every three minutes of transmission period.
- i) In HF operation or when operating in the frequencies below 50 MHz, the operator should convey your callsign in the initial transmission and subsequently at least once in every 10 minutes of transmission period.
- j) All callsigns must be spelled according to the International Phonetic Alphabet for letters and figure. Please refer to Appendix 4 for details.
- k) When operating amateur radio station through amateur radio repeater station, the order of priority shall be as below.

Station Priority	Station Type
First	Stations relaying / transmitting emergency or distress messages
Second	Low powered and hand held stations
Third	Mobile stations
Fourth	Base and high powered portable stations

- l) The control operator of the amateur radio repeater station should assign highest priority to stations providing emergency communications at any time and any amateur radio frequencies.

Signal and Radio Check

A signal and radio check is necessary to ensure that your amateur radio station is in the good condition for the operation from time to time. To eliminate any possible interference that may occur during the check, the following procedures should be follow strictly.

- a) All transmitter tuning must be done by using dummy load.
- b) Make sure that the frequency to be used for the test is free when performing the antenna test.

- c) Callsign must be used to identify the operator and clarify the purpose of the test.

Interference

Please ensure that the radio transmission does not cause interference to any other radio services. Regulation 15 (1) of the Communications and Multimedia (Technical Standards) Regulations 2000 states that ***no person shall intentionally design, install, operate, maintain or modify any communications equipment in a manner is likely to cause interference with, impairment, or malfunction of, or harm to any communications equipment or any other equipment.***

Regulation 15 (2) of the regulation denotes that ***a person who contravenes this regulation commits an offence and shall, on conviction, be liable to a fine not exceeding three hundred thousand ringgit (RM300,000.00) or to imprisonment for a term of not exceeding three years or to both.***

To eliminate the potential of interferences, the following procedures must be followed strictly.

- a) Ensure that sufficient equipment, tools and test gear is available and can be used to monitor and verify that your transmission does not cause any interference to other radio services.
- b) The operator of an amateur radio station must responsible if their station is found to be the cause of interference. Immediate remedial actions must be taken to rectify the problems in case of interference.
- c) Ensure that the transmission do not exceed the level of over deviation.
- d) Ensure that the radiated energy is always within the narrowest possible frequency bands for any class of emission in use.
- e) The radiation of harmonics and spurious emissions should be suppressed to minimize interference.

Signal Reports

A signal reports is a report on signal strength received by amateur radio station when a contact between amateur radio stations is established. Both stations will exchange signal report to give an idea on how good is the signal at the receiving station. This report will assist the amateur radio operator to make necessary adjustment to improve their transmission quality. The scale to indicate the telephony (voice) signal quality is called a Readability and Signal Strength Scale (RS). The scale is shown below.

Readability Scale (R)

- 1 Hardly perceptible; unreadable
- 2 Weak; readable every now and then
- 3 Fairly good; readable but with difficulty
- 4 Good; readable
- 5 Very good; perfectly readable

Signal Strength Scale (S)

- 1 Unintelligible; barely perceptible
- 2 Weak signals; barely readable
- 3 Weak signals; but can be copied
- 4 Fair signals
- 5 Fairly good signals
- 6 Good signals
- 7 Moderately strong signals
- 8 Strong signals
- 9 Extremely strong signals

A “5” “9” (5 and 9) report mean that the transmitted signal is in the best quality at the received amateur station. For radiotelegraphy contact using Morse Codes, the scale to indicate signal quality in the signal report is called RST (Readability, Signal Strength and Tone) scale. The RST scale is shown in Appendix 7.

Phonetic Alphabet

The phonetic alphabet is used to avoid confusion when transmitting difficult or unusual words. The phonetic alphabet shall at all-time be used when communicating through amateur radio to minimize misspelling words in the conversation.

Callsign should be spelled phonetically. Details of the phonetic alphabet and numbers are shown in Appendix 4.

Q Codes

The Q code is a set of three letter code to be used in radiotelegraphy and amateur radio communications. The Q codes are more commonly used as shorthand nouns, verbs or adjectives. The Q Codes that commonly used in amateur radio purpose is shown in Appendix 5.

CW Abbreviation

The CW is abbreviated for Continuous Wave. In truth, a continuous wave is an un-modulated and un-interrupted RF wave, however in common amateur radio services, it denote Morse code transmission because it carries no audio modulation.

The use of abbreviations will cut down the unnecessary transmission. Do not abbreviate unnecessarily when communicating in CW. The common CW abbreviation in radio amateur services is listed in Appendix 6.

Callsign

A callsign of a station in the Amateur Radio Service in Malaysia is formed by two characters followed by a digit and a group of not more than three letters consist of a group of letters and/or numbers. It can be assigned to a base, mobile and portable amateur radio stations. Callsign should be used for initial contact and again when communication is concluded.

The amateur radio station will be allocated with a maximum of a six character callsign based on the three main geographical territories of Malaysia i.e. Peninsular, Sabah and Sarawak and according to category of the amateur radio services. Details of the callsign allocation are shown in Appendix 3.

Prohibited Transmission for Amateur Radio Station

The following transmissions are strictly prohibited:-

- a) Communications relating to anti-government, religion, politics, business and racial issues and any other forms of issues which are sensitive to the peoples of Malaysia.
- b) Do not transmit any music; communications intended to facilitate a criminal act; messages in codes or ciphers intended to obscure the meaning thereof, except as provided herein; messages containing profane, offensive, obscene or indecent words of any language; or false or deceptive messages, signals or identification.
- c) You should not engage in any form of broadcasting or using the amateur radio apparatus for sending news, advertisements and communications of a business or non-experimental character or messages for pecuniary rewards or messages for and on behalf of a third party.
- d) You should not use amateur radio apparatus for malicious intent such as disrupting the usage of the amateur radio frequency and or any other similar acts that can cause interferences.
- e) You should not retransmit programs or signals emanating from any type of radio station other than an amateur station except weather forecast information intended for use by the general public and originated from Malaysian Government station.

PART C: RADIO AMATEUR EXAMINATION SYLLABUS

The syllabus for the Radio Amateur Examination is specified below.

I. Regulation and Approval Condition

Knowledge on:

- a) The ITU Radio Regulation;
- b) The operation of a station performing an amateur experimental service and those provisions relating to the operation of the station in general; and
- c) The scope of ITU Radio Regulation.
 - i) The number of regions and which region Malaysia belongs to;
 - ii) The prefixes of the “callsign” allocated to Malaysia; and
 - iii) The definition of Amateur Service.
- d) Basic understanding on relevant provision under the Acts which are applicable to the amateur radio services specifically. You must have basic knowledge on:
 - i) The Communications and Multimedia Act 1998;
 - ii) The Communications and Multimedia (Technical Standards) Regulations 2000;
 - iii) The Communications and Multimedia (Spectrum) Regulations 2000;
 - iv) The Malaysian Communications and Multimedia Commission (SKMM) as the regulatory authority for amateur radio in Malaysia;
 - v) The Apparatus Assignment for amateur radio operation such as qualifications requirement, fees, assignment classes and other related;
 - vi) The frequencies allocations, AA conditions (terms, provisions and limitations) and frequency bands, power level, class of emission code and types of transmission; and
 - vii) Nature of Amateur Service and Amateur Satellite Service.

II. Operating Procedure and Practice

Knowledge on the operating practices of radio amateur operator such as:

- a) Calling procedures in telegraphy and telephony – general calls to all stations and calls to specific stations;
- b) Log-keeping – Maintenance of a log book in accordance with the ASAA and the Amateur Operating Procedure (AOP) requirements;
- c) Use of satellites and repeaters – the purposes, limitations, and methods of accessing;

- d) Use of Q codes and other abbreviations appropriate to the Amateur Service;
- e) The phonetic alphabet – reasons for its use;
- f) Practical knowledge such as definition of squelch, VOX and etc.;
- g) The reasons for band planning – advantages of band planning;
- h) The use of phonetic alphabet – reasons for its use; and
- i) Safety precautions in amateur station – safety in operation and maintenance.

III. Technical Aspect of Electronics and Radiocommunication

Knowledge on basic / fundamental theory of electricity, electronics and radio communications.

1. Ohm's Law

- a) The meaning of basic electrical terms such as voltage, current, conductor, insulator and resistance; and
- b) The units and their meanings.

2. AC & DC voltage, current, inductance, resistance, impedance, conductor and insulator

- a) The relationship between voltage, current and power in the D.C. circuit;
- b) The sine wave – definition of amplitude, frequency and period peak, peak-to-peak, instantaneous average and r.m.s. values, simple explanation of the terms phase angle, phase difference, phase lag and lead;
- c) Important characteristics of conductors, semi-conductors and insulators – conductivity, resistivity and temperature coefficient of resistance;
- d) Inductance and capacitance – units, inductive and capacitive reactance.
- e) Electromagnetic induction – description of effects of self and mutual inductance; and
- f) Series and parallel tuned circuits, resonance, impedance, dynamic resistance, calculation of resonant frequency amplification of current and voltage at resonance Q (magnification) factor.

3. Transistor, resistor, capacitor, rectifier, switch, fuse and etc.

- a) Resistors – symbols, types, colour coding, tolerance, wattage ratings, resistors in series and parallel;
- b) Capacitors – symbols, characteristics and uses of paper, ceramic, silvered mica, polystyrene, variable and pre-set, non-inductive, electrolytic and tantalum capacitors;

- c) Effects of capacitance in A.C. circuits – meaning of capacitance reactance, dielectric strength, breakdown voltage, absorption and losses; electrostatic shielding;
- d) Principles and action of fuses, circuit breakers and safety devices – safety precautions; and
- e) Use of solid state devices such as audio and radio frequency amplifiers, oscillators, frequency multipliers, mixers, demodulators and switches.

4. Solid State Device

- a) Characteristics of junction diodes, NPN, PNP, and field effect transistors (FETs);
- b) The common transistor circuit configurations, emphasizing the biasing arrangements and conditions and input and output impedances;
- c) Semiconductor diodes – symbols, elementary principles of semiconductor diodes including zener diodes and their electrical characteristics
- d) Transistors – characteristics and principles of operation of NPN and PNP transistors, control of output current and voltage when transistors are used as audio frequency and radio frequency amplifiers;
- e) Use of solid state devices including integrated circuits in radio equipment such as:
 - i) audio and radio frequency amplifier;
 - ii) oscillators (crystal and variable frequency types);
 - iii) amplifiers (audio frequency and radio frequency types);
 - iv) frequency changers;
 - v) frequency multipliers;
 - vi) demodulators; and
 - vii) switches;
- f) Typical power supply circuits, power rectification, single phase half wave, full wave and bridge connections, smoothing and voltage stabilization systems; and
- g) Rectification, smoothing and voltage stabilization arrangements in low voltage supplies.

5. Receiver

- a) Principles of reception of continuous waves, double sideband and single sideband and frequency modulated signals in terms of radio frequency amplification, frequency changing (where appropriate), demodulation or detection, automatic gain control, audio amplification and the super heterodyne principle of reception;

- b) Advantages and disadvantages of high and low intermediate frequencies, adjacent channel and image frequency interference and their avoidance and capture effect;
- c) Sensitivity and selectivity;
- d) Radio frequency amplifiers, tuned circuit, gain, frequency response and linearity;
- e) Audio frequency amplifiers, coupling, emitter follower, phase splitters, negative feedback, decoupling and power amplifiers; and
- f) Typical receivers, use of a beat frequency oscillator, characteristics of a single sideband signal and the purpose of a carrier insertion oscillator.

6. Transmitter

- a) Oscillators used in transmitters – stability of variable frequency and crystal controlled oscillators, their construction and factors affecting stability.
- b) Synthesizers – advantages and disadvantages, purpose of each stage with block diagram;
- c) Transmitter – stages function of frequency changers, frequency multipliers, high and low power amplifiers (including linear types);
- d) Transmitter tuning and adjustment;
- e) Methods of keying transmitters for telegraphy – advantages and disadvantages;
- f) Voice operated controls; and
- g) Methods of modulation and types of emission in circuit use including single sideband and frequency/phase modulation – emissions in the A3E, J3E, F3E and G3E modes, relative advantages, adjustment of level of modulation.

7. Propagation and antenna

- a) Receiving and transmitting antennas – operation and construction of typical antennas including multi band and directional types, their directional properties, coupling and matching;
- b) Explanation of basic terms – ionosphere, troposphere, atmosphere, field strength, polarization, maximum usable frequency, critical frequency and skip distance;
- c) Generation of electromagnetic waves – relationship between electric and magnetic components;
- d) Structure of the ionosphere – refracting and reflecting properties of the ionosphere and troposphere, effect of sunspot cycle, winter and summer seasons and day and night on the ionization of the upper atmosphere, effect of varying degrees of ionization on the propagation of electromagnetic waves;
- e) Ground waves, ionospheric and tropospheric propagation;

- f) Fade out and types of fading – selective, interference, polarization, absorption and skip;
- g) Velocity of radio waves in free space, relationship between velocity of propagation, frequency and wavelength, calculation of frequency and wavelength;
- h) Antenna feeders – open and coaxial types; and
- i) Transmission lines – balanced and unbalanced feeders, elementary principles of propagation of radio waves along transmission lines, velocity ratio and standing waves.

8. Interference

- a) Spurious emissions, causes and methods of prevention, harmonics of the radiated frequency, direct radiation from frequency determining stages (including synthesizers) and frequency changing stages of a transmitter, parasitic oscillations, excessive sidebands due to over modulation, excessive deviation of FM transmitters, key clicks, methods of suppression;
- b) Frequency stability, consequences of poor frequency stability, risks of interference, out of band radiation, causes and methods of elimination;
- c) Restriction of audio bandwidth, typical methods and their limitations;
- d) Mains borne interference, causes and methods of suppression;
- e) Types of filters, low frequency and radio frequency filters;
- f) The requirements of frequency checking equipment; and
- g) Band planning, purposes and advantages.

9. Electromagnetic Compatibility (EMC)

- a) EMC – the ability of a device, equipment or system to function satisfactorily in its electromagnetic environment without introducing intolerable electromagnetic disturbances to anything in that environment. EMC problems that is likely to occur when an amateur station operates in close proximity to other electronic equipment;
- b) Equipment used in an amateur station that is capable of generating broad band and narrow band interference;
- c) Interfering signal paths – RF, IF, audio and mains borne;
- d) Methods of improving the immunity of affected equipment i.e.:
 - i) use of toroidal chokes and filters (mains, high pass, low pass, band pass, notch or band stop);
 - ii) characteristics of filters, bandwidth, insertion loss and impedance; and
 - iii) screening, lead lengths, and fitting ferrite rings and beads and bypass capacitors;

- e) Improving station design by:
 - i) RF grounding;
 - ii) station mains filtering;
 - iii) screening;
 - iv) monitoring output power and calculation of field strengths;
 - v) monitoring output transmission for spurious and harmonic levels including key clicks;
 - vi) location of antennas and masts;
 - vii) type and size of antennas; and
 - viii) use of screened feeder cables, balanced lines and balloons; and
- f) Method of approach and basic checks required when investigating EMC problems with a neighbour's equipment.

10. Measurement

- a) Types of instruments used in radio work for the measurement of AC, DC and RF voltages and current, error in measurement, analogue and digital multi meters and oscilloscopes; and
- b) Measurement of:
 - i) DC power input to power amplifiers;
 - ii) RF power output of power amplifiers;
 - iii) Current at radio frequencies;
- c) Purposes, operation and use of absorption wave-meters, crystal calibrators, heterodyne wave-meters and frequency counters, relative accuracy;
- d) Dummy loads, their purposes, construction and use in adjusting/tuning transmitters;
- e) Use of standing wave ratio meters, dip oscillator and etc. and;
- f) Setting up and use of an oscilloscope to examine and measure waveform and monitor the depth of modulation.

11. General

- a) Function and uses of the transformer;
- b) Simple explanation of how the decibel notation is used to express ratios of power and voltage and how it may also be used to define power levels;
- c) Reasons why equipment to be repaired should be disconnected from the mains supply and capacitors discharged; and
- d) Recommended precautions.

Appendix 1: Amateur Frequency Band, Power and Classes of Emission

Class A privilege

Band	Frequency Band (MHz)	Maximum Power Level (Watts PEP)	Class of Emission
HF	1.800 – 2.000	25	1A, A2A
	3.500 – 3.900	400	A3E, R3E, J3E, F1A, F2A and F3E
	7.000 – 7.100		
	10.100 – 10.150		
	14.000 – 14.350		
	18.068 – 18.168		
	21.000 – 21.450		
	24.890 – 24.990		
28.000 – 29.700			
VHF	50.000 – 54.000	50	A1A, A2A, A3E and F1A F2A, J3E, R3E and F3E
	144.000 – 148.000	50	
	145.800-146.000	50	
UHF	430.000 – 440.000	50	F3E and F1W
	1,240.000 – 1,300.000	50	A1A, A2A
	2,300.000 – 2,450.000	50	A3E, R3E
	3,300.000 – 3,500.000		
	5,650.000 – 5,850.000	50	J3E and F1
	10,000.000 – 10,500.000		
	47,000.000 – 47,200.000		
	24,000.000 – 24,050.000	50	A3C, C3F
	75,500.000 – 81,000.000		
241,000.000 – 250,000.000	25		

Class B privilege

Band	Frequency Band (MHz)	Maximum Power Level (Watts PEP)	Class of Emission
HF	28.000 – 29.700	50	A3E, F1A, F2A, F3E, J3E and R3E
VHF	50.000 – 54.000		
	144.000 – 148.000		
UHF	430.000 – 440.000		

Note: Please refer to Appendix 2 for the Class of Emission code.

Appendix 2: Class of Emission Code

Emissions are classified and symbolized according to their basic characteristics. The basic characteristics are:

- a) First symbol – type of modulation of the main carrier;
- b) Second symbol – nature of signal(s) modulating the main carrier; and
- c) Third symbol – type of information to be transmitted.

i) Basic characteristic

1. First symbol – Type of modulation of the main carrier

<u>Symbol</u>	<u>Type of modulation of the main carrier</u>
---------------	---

N	Emission of an un-modulated carrier
---	-------------------------------------

Emission in which the main carrier is amplitude modulated (including cases where sub-carriers are angle modulated):

A	i) Double-sideband
H	ii) Single-sideband, full carrier
R	iii) Single-sideband, reduced or variable level carrier
J	iv) Single-sideband, suppressed carrier
B	v) Independent sidebands
C	vi) Vestigial sideband

Emission in which the main carrier is angle-modulated:

F	i) Frequency modulation
G	ii) Phase modulation
D	Emission in which the main carrier is amplitude and angle modulated either simultaneously or in a pre-established sequence

Emission of pulses:

P	i) Sequence of un-modulated pulses
---	------------------------------------

A sequence of pulses:

K	i) modulated in amplitude
L	ii) modulated in width/duration
M	iii) modulated in position/phase

Symbol Type of modulation of the main carrier

- | | |
|---|---|
| Q | iv) in which the carrier is angle-modulated during the angle period of the pulse |
| V | v) which is a combination of the foregoing or is produced by other means |
| W | Cases not covered above, in which an emission consists of the main carrier modulated, either simultaneously or in a pre-established sequence, in a combination of two or more of the following modes: amplitude, angle, pulse |
| X | Cases not otherwise covered |

2. Second symbol – Nature of signal(s) modulating the main carrier

Symbol Nature of signal(s) modulating the main carrier

- | | |
|---|--|
| 0 | No modulating signal |
| 1 | A single channel containing quantized or digital information without the use of a modulating sub-carrier |
| 2 | A single channel containing quantized or digital information with the use of a modulating sub-carrier |
| 3 | A single channel containing analogue information |
| 7 | Two or more channels containing quantized or digital information |
| 8 | Two or more channels containing analogue information |
| 9 | Composite system with one or more channels containing quantized or digital information, together with one or more channels containing analogue information |
| X | Cases not otherwise covered |

3. Third symbol – Type of information to be transmitted

Symbol Type of information to be transmitted

- | | |
|---|---|
| N | No information transmitted |
| A | Telegraphy – for aural reception |
| B | Telegraphy – for automatic reception |
| C | Facsimile |
| D | Data transmission, telemetry, telecommand |
| E | Telephony (including sound broadcasting) |

- F Television (video)
- W Combination of the above
- X Cases not otherwise covered

Note: *The term "Information" does not represent a signal of a constant unvarying nature, as provided by standard frequency emissions, continuous wave and pulse radars and etc.*

ii) Description of Emission (Optional)

These are:

- a) Fourth character – details of signal(s)
- b) Fifth character – nature of multiplexing

Where the fourth or fifth characters are not used please indicate on the form by a (-) where each character would otherwise appear.

4. Fourth character – Details of signal(s)

<u>Symbol</u>	<u>Details of signal(s)</u>
A	Two-condition code with elements of differing numbers and/or durations
B	Two-condition code without elements of the same number and duration with error correction
C	Two-condition code with elements of the same number and duration with error correction
D	Four-condition code in which each condition represents a signal element (of one or more bits)
E	Multi-condition code in which each condition represents a signal element (of one or more bits)
F	Multi-condition code in which each condition or combination of conditions represents a character
G	Sound of broadcasting quality (monophonic)
H	Sound of broadcasting quality (stereophonic or quadraphonic)
J	Sound of commercial quality (excluding categories given in K and L below)
K	Sound of commercial quality with the use of frequency inversion or band splitting
L	Sound of commercial quality with separate frequency modulated signals to control the level of demodulated signal

<u>Symbol</u>	<u>Details of signal(s)</u>
M	Monochrome television (video only)
N	Colour television (video only)
W	Combination of the above
X	Cases not otherwise covered

5. Fifth character – Nature of multiplexing

<u>Symbol</u>	<u>Nature of multiplexing</u>
N	No multiplexing employed
C	Code Division Multiplex (This includes bandwidth expansion techniques)
F	Frequency Division Multiplex
T	Time Division Multiplex
W	Combination of Frequency Division Multiplex and Time Division Multiplex
X	Other types of multiplexing

Note:

Definitions in this document are based on the Radio Regulations published by the ITU, 1998.

Appendix 3: National Amateur Callsign

Geographical Territory	Category	National Amateur Callsign
Peninsular Malaysia	Class A	9M2LLL
	Class B	9W2LLL
Sabah	Class A	9M6LLL
	Class B	9W6LLL
Sarawak	Class A	9M8LLL
	Class B	9W8LLL

Note: “L” represents any letter from “A” to “Z”

For details on callsign allocation, please refer to the “**Guideline on the Allocation of Callsign to the Amateur Radio Service**” published by the SKMM.

Appendix 4: International Phonetic - Alphabet and Figure Code

When it is necessary to spell out callsigns, service abbreviations and words, the following pronunciations shall be used:

Letter to be transmitted	Code word to be used	Spoken as*
A	Alfa	<u>AL</u> FAH
B	Bravo	<u>BRAH</u> VOH
C	Charlie	<u>CHAR</u> LEE or <u>SHAR</u> LEE
D	Delta	<u>DELL</u> TAH
E	Echo	<u>ECK</u> OH
F	Foxtrot	<u>FOKSTROT</u>
G	Golf	GOLF
H	Hotel	HOH <u>TELL</u>
I	India	<u>IN</u> DEE AH
J	Julieta	<u>JEW</u> LEE <u>ETT</u>
K	Kilo	<u>KEYLOH</u>
L	Lima	<u>LEEMAH</u>
M	Mike	MIKE
N	November	NO <u>VEN</u> BER
O	Oscar	<u>OSSCAH</u>
P	Papa	<u>PAHPAH</u>
Q	Quebec	KEH <u>BECK</u>
R	Romeo	<u>ROW</u> ME OH
S	Sierra	SEE <u>AIR</u> RAH
T	Tango	<u>TANG</u> GO
U	Uniform	<u>YOU</u> NEE FORM or <u>OO</u> NEE FORM
V	Victor	<u>VIKTAH</u>
W	Whiskey	<u>WISS</u> KEY
X	X-ray	<u>ECKSRAY</u>
Y	Yankee	<u>YANG</u> KEY
Z	Zulu	<u>ZOO</u> LOO

* The syllables to be emphasized are underlined.

When it is necessary to spell out figures or marks, the following pronunciations shall be used:

Letter to be transmitted	Code word to be used	Spoken as **
0	Nadazero	NAH-DAH-ZAY-ROH
1	Unaone	OO-NAH-WUN
2	Bissotwo	BEES-SOH-TOO
3	Terrathree	TAY-RAH-TREE
4	Kartefour	KAR-TAY-FOWER
5	Pantafive	PAN-TAH-FIVE
6	Soxisix	SOK-SEE-SIX
7	Setteseven	SAY-TAY-SEVEN
8	Oktoeight	OK-TOH-AIT
9	Novenine	NO-VAY-NINER
Decimal point	Decimal	DAY-SEE-MAL
Full stop	Stop	STOP

** Each syllable should be equally emphasized.

Source:ITU Radio Regulations, Appendix S14

Appendix 5: The International Q Code

Below are some of the International Q Codes commonly used in the Amateur Service with their meanings, when used as a question and as a statement. The Q signal procedurals are for use in Morse communications, but some have been adopted into voice usage as well, with similar meanings.

- QRG? : Will you tell me my exact frequency (or that of)?
Your exact frequency (or that of) is..... KHz.
- QRH? : Does my frequency vary?
Your frequency varies.
- QRI? : How/What is the tone of my transmission?
The tone of your transmission is..... (1 = good, 2 = variable, 3 = bad).
- QRK? : What is the intelligibility of my signals (or those of)?
The intelligibility of your signals (or those of)is..... (1 = bad, 2 = poor, 3 = fair, 4 = good, 5 = excellent).
- QRL? : Are you (or is the frequency) busy?
Voice Usage I am (or the frequency is) busy (with.....); please do not interfere.
(QRL is never spoken but it is customary to say "Is this frequency in use?" before making a call on an apparently-free frequency)
- QRM? : Is my transmission being interfered with?
Voice Usage Your transmission is being interfered with (1 = nil, 2 = slightly, 3 = moderately, 4 = severely, 5 = extremely)
(QRM is sometimes spoken as "you're getting QRMd" or "there's a lot of QRM" to indicate that the frequency is very congested)
- QRN ? : Are you troubled by static?
I am troubled by static (1 = nil, 2 = slightly, 3 = moderately, 4 = severely, 5 = extremely)
- QRO? : Shall I increase transmitter (output) power?
Increase transmitter (output) power.
- QRP? : Shall I decrease transmitter (output) power?
Voice Usage Decrease transmitter (output) power.
(QRP has a more absolute "low power operation" meaning rather than a relative "please lower your power" one. "Operating QRP" refers to the sport of trying to make contacts with as low a power as possible, usually 5 watts or less)
- QRQ? : Shall I send faster?
Send faster (..... words per minute).

- QRS? : Shall I send more slowly?
Send more slowly (..... words per minute).
- QRT? : Shall I stop sending?
Voice Usage Stop sending / I am leaving the air.
(**QRT** is sometimes used to indicate that one is signing off. "I'm going QRT now")
- QRU? : Have you anything for me?
I have nothing for you.
- QRV? : Are you ready?
I am ready.
- QRW? : Shall I inform that you are calling on KHz?
Please inform that I am calling on KHz?
- QRX? : When will you call me again?
Standby / I will call you again athours on..... KHz.
- QRZ? : Who is calling me?
Voice Usage You are being called by on..... KHz.
(**QRZ** is always spoken "Q R Zed" and is used when one catches part of a call, particularly on an FM repeater, but can't tell which station is being called. If I hear a friend of mine call someone, and it might be me, but I'm not sure, I might say "QRZ for 9M2XXX?" It can be used this way whenever there is doubt about whom the calling station is calling or what they want)
- QSA? : What is the strength of my signals (or those of)?
The strength of your signals (or those of) is..... (1 = barely perceptible, 2 = weak, 3 = fairly good/okay, 4 = good, 5 = very good).
- QSB? : Are my signals fading?
Your signals are fading.
- QSD? : Are my signals mutilated / Is my keying defective?
Your signals are mutilated / Your keying is defective.
- QSG? : Shall I send messages at a time? How many messages should I send at a time?
Send messages at a time.
- QSK? : Can you hear me between your signals and if so may I break in on your transmissions?
I can hear you between my signals; break in on my transmissions.

- QSL? : Can you acknowledge receipt?
Voice I acknowledge receipt.
Usage *(QSL when spoken either as a question or a statement has much of the meaning of "okay" or "I understand" or "I will comply." "I'll meet you later on at the house, QSL?" When communication quality is poor, "QSL" is sometimes repeated three or more times to indicate that the message was indeed received)*
- QSM? : Shall I repeat?
Repeat the last message you sent me (or message number).
- QSN? : Did you hear me (or) onKHz?
I heard you me (or) onKHz
- QSO? : Can you communicate withdirectly or by relay?
Voice I can communicate withdirectly (or via relay)
Usage *(QSO when spoken simply means "2-way contact." "Eyeball QSO" refers to a face-to-face meeting)*
- QSP? : Will you relay to.....?
I will relay to
- QST? : Attention all radio amateurs:
Voice *(QST is usually used to introduce a broadcast message to all amateurs (the only type of one-way message allowed on amateur radio). "The following is a QST:"*
Usage
- QSU? : Shall I send or reply on this frequency (or on KHz)?
Send or reply on this frequency (or on KHz)
- QSV? : Shall I send a series of V's for adjustment on this frequency?
Send a series of V's.
- QSX? : Will you listen to on KHz?
I am listening to on KHz.
- QSY? : Shall I (Will you) change frequency (to)?
Voice I am changing frequency (to)
Usage *(QSY when spoken is either a suggestion or an announcement that one is changing frequencies. "QSY simplex?" is a suggestion that the two conversing parties leave the repeater to another non-repeater frequency in order to free up the repeater resource. Signing off using "this is KF9FF, QSY" conveys that I cannot be reached on the current frequency any longer (lest anyone try).*
- QSZ? : Shall I send each word or group more than once?
Send each word or group twice.

- QTA? : Shall I cancel message number?
Cancel message number
- QTB? : Do you agree with my counting of words?
I disagree with your count of words. I will repeat the first letter of
each word in the message.
- QTH? : What is your location?
Voice My location is.....
Usage (**QTH** has the identical meaning as in Morse. "What's your QTH?"
"I'm nearly home").
- QTR? : What is the correct time?
The correct time is hours.

Appendix 6: Abbreviation used for CW work

<u>Abbreviation</u>	<u>Meaning</u>
AA	After all
AB	All before
AB	About
ADR	Address
AGN	Again
ANT	Antenna
AR K	End of transmission
AR VA	Final end of transmission
AS	Wait
BCI	Broadcast interference
BCL	Broadcast listener
BK	Break, I wish to interrupt a transmission in progress; break in; break me
BN	All between; been
BUG	Semi-automatic key
B4	Before
C	Yes
CFM	I confirm, confirm
CK	Check
CL	I'm closing all my station; call
CLD	Called
CLG	Calling
CPY	Copy
CPI	Copy
CQ*	General call; calling any station
CS	Callsign
CT	Commence traffic
CUAGN	See you again
CUD	Could
CUL	See you later
CW*	Continuous wave (i.e. radiotelegraph)
DE	From

<u>Abbreviation</u>	<u>Meaning</u>
DLD	Delivered
DLVD	Delivered
DR	Dear
DX*	Distance, foreign countries
ES	And; &
FB	Fine business, excellent
FER	For
FM*	Frequency modulation, from
GA	Go ahead (or resume sending)
GB	Goodbye
GBA	Give better address
GE	Good evening
GG	Going; grounded grid
GM	Good morning
GN	Good night
GND	Ground
GUD	Good
HI*	The telegraphic laugh; high
HPE	Hope
HR	Here; hear; hour
HV	Have
HVE	Have
HW	How
K	Go ahead
KN	Specific station, go ahead
LID	Poor operator
MA, MILS	Milliamperes
MNI	Many
MSG	Message; prefix to radiogram
N	No; north
NCS	Net control station
ND	Nothing doing
NIL	Nothing, I've nothing for you

<u>Abbreviation</u>	<u>Meaning</u>
NM	No more
NR	Number
NW	Now; I resume transmission
OB	Old boy
OC	Old chap
OG	Old girl
OM	Old man
OP	Operator
OPR	Operator
OT	Old timer; old top
PBL	Preamble
PSE	Please
PLSE	Please
PWR	Power
PX	Press
R	Received as transmitted (also used as a decimal point e.g. IR6)
RCD	Received
RCVR (RX)	Receiver
REF	Refer to; referring to
RFI	Radio frequency interference
RIG*	Station equipment
RPRT	Report
REPT	Report
RPT	Repeat; I repeat; report
RTT	Radio-teletype
RTTY	Radio-teletype
RX*	Receiver
SA	Say
SASE	Self-addressed, stamped envelope
SED	Said
SIG	Signal; signature
SINE	Operator's personal initials; nickname

<u>Abbreviation</u>	<u>Meaning</u>
SKED	Schedule
SRI	Sorry
SSB	Single sideband
SUM	Some
SVC	Service; prefix to service message
T	Zero (0)
TFC	Traffic
THO	Though
THRU	Through
THRO	Through
TMW	Tomorrow
TNX	Thanks
TKS	Thanks
TKU	Thank you
TT	That
TU	Thank you
TVI	Television interference
TX&*	Transmitter
TXT	Text
U	You
UR	Your; you're
URS	Yours
UTC	Coordinated Universal Time; this is effectively the same as GMT.
VFO	Variable frequency oscillator
VY	Very
WA	Word after
WB	Word before
WD-WDS	Word: words
WID	With
WKD	Worked
WKG	Working
WL	Well; Will

<u>Abbreviation</u>	<u>Meaning</u>
WUD	Would
WX*	Weather
X	Press
XCVR	Receiver
XMTR (TX)	Transmitter
XTAL	Crystal
XYL* (YF)	Wife
YL*	Young Lady
73*	Regards
88*	Love and Kisses

Codes in asterisk (*) are to a limited extent, adopted and accepted in the phone band.

Appendix 7: The RST System

<u>Readability</u>	<u>Signal Strength</u>	<u>Tone</u>
1 - Unreadable	1 - Faint, signals barely	1 - Extremely rough hissing note
2 - Barely readable, occasional words distinguishable	2 - Very weak signals	2 - Very rough AC note, no trace of musicality
3 - Readable with considerable difficulty	3 - Weak signals	3 - Rough. Low-pitched AC note, slightly musical
4 - Readable with practically no difficulty	4 - Fair signals	4 - Rather rough AC note, moderately musical
5 - Perfectly readable	5 - Fairly good signals	5 - Musically modulated note
	6 - Good signals	6 - Modulated note, slight trace of whistle
	7 - Moderately strong signals	7 - Near DC note, smooth ripple
	8 - Strong signals	8 - Good DC note, just trace of ripple
	9 - Extremely strong signals	9 - Purest DC note

Appendix 8: List of countries which have reciprocal arrangement with Malaysia



Australia



Mongolia



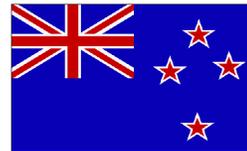
Cambodia



Myanmar



China



New Zealand



Czechoslovakia



Pakistan



Finland



Republic Germany



India



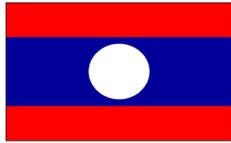
Slovak Republic



Indonesia



Sri Lanka



Laos



Sweden



Switzerland



United Kingdom



Thailand



Vietnam

Appendix 10: Sample of the statutory declaration regarding secrecy of wireless communications



Suruhanya Komunikasi Dan Multimedia Malaysia

Jalan IMPACT Off Persiaran Multimedia
63000 Cyberjaya, Selangor
Tel: +603 8688 8000 Fax : +603 8688 1000

STATUTORY DECLARATION REGARDING SECRECY OF WIRELESS COMMUNICATIONS

To be included with application for land and mobile stations, amateur radio apparatus assignments.

I, _____
of _____

NRIC No./Passport No. _____ do solemnly and sincerely declare:

1. That I will hold all confidential information on all wireless telegraphic or other communications that may pass through my hands or come to my knowledge in the execution of the wireless or telephonic duties entrusted to me.
2. That I will not directly or indirectly divulge to any person (other than a properly authorized official of Malaysia or a competent legal tribunal), or make any message or information coming to my knowledge by reason of the amateur radio apparatus assignment installation. If employed as an operator at a station apparatus assignment to conduct commercial wireless traffic, I will not give any information directly or indirectly respecting such message or communication except to the persons for whom such messages or communications are intended of my employer.
3. That I will not transmit or cause to be transmitted by wireless telegraphy or telephony any message received by me for transmission or delivered to any person any message received by me by wireless telegraphy or telephony, unless the delivery of such message has been approved by the Chairman or by official duly authorized by him to approve thereof.

And I make this solemn declaration conscientiously believing the same to be true and by virtue of the provisions of the Statutory Declarations 1960.

Subscribed and solemnly declared by the above named _____
at _____ this _____ day of _____, 20____.

Signature: _____ Before me: _____

Note:

To be signed before a Justice of the Peace, Magistrate or a Commissioner of Oaths. Any person who makes a false statement in a declaration is guilty of an offence and is liable to imprisonment for three years and is also liable to a fine.

Appendix 11: Sample of Amateur Service Apparatus Assignment Form



Suruhanjaya Komunikasi dan Multimedia Malaysia
Malaysian Communications and Multimedia Commission
Off Persiaran Multimedia
63000 Cyberjaya, Selangor MALAYSIA
T: +60 3 86 88 80 00 F: +60 3 86 88 10 00 E: ccd@cmc.gov.my W: www.skmm.gov.my

**APPLICATION FOR APPARATUS ASSIGNMENT (S)
(AMATEUR SERVICE)**

<input checked="" type="checkbox"/> New apparatus <input type="checkbox"/> Type of apparatus (Please refer to instructions):		Application Fee RM60 per application
<input type="checkbox"/> Existing apparatus	Client ID no.: _____ Assignment no.(s): _____ Callsign: 9W2FTL	

To be used when applying for all amateur service apparatus assignment (s)

1. CLIENT INFORMATION

Organisation name:	N/A				
Applicant name:	AHMAD BIN ALI				
Business / Residential address:	NO 80, JALAN MAJU JAYA, TAMAN PUTERA				
Town / State:	SUNGAI BESI, KUALA LUMPUR	Postal code:	43000		
Billing address: (if different from above)	SAME AS ABOVE				Postal code:
E-Mail: ahmad@yahoo.com	Telephone: 03-87878787	Fax: 03-87878788	Occupation:	ENGINEER	
Passport / IC No.:	800420-11-5037	Date of birth: 20-04-1980	Place of birth:	KUANTAN	
Citizenship:	<input checked="" type="checkbox"/> Malaysian	<input type="checkbox"/> Commonwealth	<input type="checkbox"/> Other, please specify _____		

2. APPLICATION INFORMATION

Class (A/B)	B				
-------------	---	--	--	--	--

3. GEOGRAPHIC AREA INFORMATION

Location name: <i>If mobile, enter the vehicle registration no.</i>	WFH 4113 /AS PER ADDRESS				
Site address:	AS ABOVE				
Town / State:	SUNGAI BESI, KUALA LUMPUR	Postal code:	43000		
Apparatus name:	N/A	Ground elevation: <i>(metres above mean sea level)</i>	N/A		
Number of mobiles / hand-carried portables:	1	Hand-carried portable (Y/N):	YES		
Geographic area of operations:	N/A	Coverage radius (km):	N/A		
Centre of area of operations Latitude (°N):	_ 3 _ ° _ 6 ' _ 20 _ "	Longitude (°E):	_ 101 _ ° _ 30 ' _ 25 _ "		
Structure height (m):	N/A	Building height (m):	N/A		

4. APPARATUS INFORMATION

Manufacturer / Model / Serial no.:	Power:	Emission:	Frequency band:	Use (transmitter, receiver etc)
ICOM 735	10 W	F1A	AMATEUR	TRANSCEIVER

5. DO YOU HAVE A LICENCE / ASSIGNMENT UNDER THE COMMUNICATIONS AND MULTIMEDIA ACT 1998? IF SO, PLEASE PROVIDE DETAILS OR A COPY OF YOUR LICENCE / ASSIGNMENT.

NO

6. PLEASE STATE THE REQUIRED VALIDITY DATE AND PERIOD.

Date: 15 JAN 2009	Date assignment is issued OR
	Date required 15 MAR 2009 (Please state the date)
Period (from 3 months to 5 years):	5 YEARS

7. I CERTIFY THAT THE STATEMENTS MADE IN THIS APPLICATION ARE COMPLETE AND CORRECT TO THE BEST OF MY KNOWLEDGE, THE APPARATUS IS TYPE APPROVED FOR USE IN MALAYSIA AND IT WILL BE USED ONLY FOR THE PURPOSES AUTHORIZED BY THE MINISTER OF ENERGY, COMMUNICATIONS AND MULTIMEDIA.

Signature:	<i>Ahmad Ali</i>	Date:	15 JAN 2009
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If applicant is under 21 years of age, counter signature of parent or guardian is required:

Note: Please enclose

1. A copy of IC or passport.
2. Letter of reference from Radio Amateur Class A user (Appendix A).
3. A declaration of secrecy (Appendix B).
4. Call sign preference form (Appendix C).

FOR CMC USE ONLY

Fee paid:	
Cheque or Bank in slip no.:	
Receipt no. / date:	

Appendix 12: Sample Letter of Reference

Mohamad Ali Bin Abu

15 Jalan 7/14A

Section 7

40000 Shah Alam

Selangor

Date: **12 January 2012**

The Chairman

Malaysian Communications and Multimedia Commission

Jalan IMPACT off Persiaran Multimedia

63000 Cyberjaya

Selangor

Dear Sir

**APPLICATION FOR AMATEUR STATION APPARATUS ASSIGNMENT (CLASS *A/B) FOR
(Applicant Name), NRIC Number: (Applicant NRIC number)**

We, the undersigned below being the authorized persons of *MARTS / Amateur Station Apparatus Assignment holder (Class A); hereby certify that Mohamad Ali Bin Abu NRIC number 800420-11-5037 is known to us and is of good character.

*He/She *has/hasn't demonstrated practical skills to us for the operation of amateur radio station and we found that *he/she is *competence/not competence to operates an amateur radio station.

Thank you.

Signed

1. 

Name: Naim Bin Nizar

Callsign: 9M2NBN since 12.8.1991 (when you obtained the Callsign)

2. 

Name: Amirah Binti Amir Khan

Callsign: 9M2AAK since 30.10.2008 (when you obtained the Callsign)

* delete where appropriate

MARTS = Malaysian Amateur Radio Transmitter Society

Appendix 13: Band Plan for Amateur Radio Services of Frequency Band 144.000 MHz – 148.000 MHz

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 144.6375 144.6500 144.6625 144.6750 144.6875 144.7000		Simplex & Digital Mode. Emergency Communications (12.5 kHz ch. bandwidth)
	144.7250 144.7500 144.7750 144.8000 144.8250 144.8500 144.8750 144.9000		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)

CHANNEL NO.	FREQUENCY (MHz)		NOTE
	Transmit (Tx)	Receive (Rx)	
	144.9250 144.9500 144.9750 145.0000		Frequency band: 144.7 MHz to 145.0 MHz Simplex System & Channel bandwidth = 25 kHz
RV48	145.0000	145.6000	
RV49	145.0125	145.6125	
RV50	145.0250	145.6250	
RV51	145.0375	145.6375	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)
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	

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		
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		

CHANNEL NO.	FREQUENCY (MHz)		NOTE
	Transmit (Tx)	Receive (Rx)	
NA	145.8000 to 146.0000		Satellite Portion
RV64	146.0125	146.6125	Frequency 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	Frequency 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	Frequency 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	

CHANNEL NO.	FREQUENCY (MHz)		NOTE
	Transmit (Tx)	Receive (Rx)	
RV107	147.1500	147.7500	<p>Frequency 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)</p>
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		<p>Frequency Band: 147.4 MHz to 147.6 MHz Simplex System & Channel bandwidth = 30 kHz.</p>
V65	147.465		
V66	147.495		
V67	147.525		
V68	147.555		
V69	147.585		

Appendix 14: Contact Details of the SKMM and its Regional Offices

Head Quarters:

Suruhanjaya Komunikasi dan Multimedia Malaysia

Jalan IMPACT off Persiaran Multimedia
63000 Cyberjaya
Selangor Darul Ehsan
MALAYSIA

Contact us at:

Telephone : 03 8688 8000
Facsimile : 03 8688 1005
E-mail : webmaster@cmc.gov.my

For consumer complains call:

Free phone: 1 800 888 030

SKMM Regional Offices

Central region

Aras 17, Wisma Sunway Mas
1, Jln Tengku Ampuan Zabedah C9/C
Seksyen 9, 40100 Shah Alam
Selangor

Tel: (03) 5518 7701
Fax: (03) 5518 7710

Northern Region

Tingkat 1, Bangunan Tabung Haji
Jalan Bagan Luar
12000 Butterworth
Pulau Pinang

Tel: (04) 323 8228
Fax: (04) 323 9448

Southern Region

Suite 7A, Aras 7, Menara Ansar
Jalan Trus
80000 Johor Bharu
Johor

Tel: (07) 226 6700
Fax: (07) 227 8700

Eastern Region

B8004, Aras 1, Sri Kuantan Square
Jalan Telok Sisek
25000 Kuantan
Pahang

Tel: (09) 512 1100 / 1119
Fax: (09) 515 7566

Sarawak Region

Aras 5 (Utara), Wisma STA
26, Jalan Datuk Abang Abdul Rahim
93450 Kuching
Sarawak

Tel: (082) 331 900
Fax: (082) 331 901

Sabah & WP Labuan Region

6-10-10, Tingkat 10, Menara MAA
Lorong Api-Api 1, Api-Api Centre
88000 Kota Kinabalu
Sabah

Tel: (088) 270 550
Fax: (088) 253 205

Miri Branch

Lot 1385, Tingkat 1, Blok 10
Centre Point Commercial Centre Fasa II
98000 Miri
Sarawak

Tel: (085) 417 400 / 600
Fax: (085) 417 900

Sandakan Branch

Lot 7, Blok 30, Bandar Indah Fasa 6
Batu 4, Jalan Utama
90000 Sandakan
Sabah

Tel: (089) 227 350
Fax: (089) 227 352