



SURUHANJAYA KOMUNIKASI DAN MULTIMEDIA MALAYSIA
Malaysian Communications and Multimedia Commission

AMATEUR RADIO COMMUNICATIONS

GUIDELINES FOR
AMATEUR RADIO IN MALAYSIA

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SURUHANJAYA KOMUNIKASI DAN MULTIMEDIA MALAYSIA

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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 the amateur radio operator
High Frequency	Frequencies ranging from 3 MHz to 30 MHz although the amateur 'top band' on 1.8 MHz 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 3 MHz to 30 MHz.
Transceiver	A combined receiver and transmitter in one unit.
Ultra High Frequency	The frequency range from 300 MHz to 3000 MHz.
Very High Frequency	The frequency range from 30 MHz to 300 MHz.

ABBREVIATION

AA	Apparatus Assignment
A.C.	Alternating Current
AROC	Amateur Radio Operator's Certificate
ASAA	Amateur Station Apparatus Assignment
AOP	Amateur Operating Procedures
CB	Citizen Band
CW	Continuous Wave
D.C.	Direct Current
EMC	Electromagnetic Compatibility
FM	Frequency Modulation
HF	High Frequency
IF	Intermediate Frequency
ITU	International Telecommunication Union
MARTS	Malaysian Amateur Radio Transmitter Society
RAE	Radio Amateur Examination
RF	Radio Frequency
SW	Short Wave
SWAL	Short Wave Amateur Listener
UHF	Ultra High Frequency
UTC	Universal Time (UTC is also known as GMT or Greenwich Mean Time)
VHF	Very High Frequency

MALAYSIAN COMMUNICATIONS AND MULTIMEDIA COMMISSION

GUIDELINES FOR AMATEUR RADIO IN MALAYSIA

General

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

- a) the candidates who intended to sit for the examination 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 which is:

- 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 utilized the same frequencies. In Malaysia the amateur radio is regulated by the Malaysian Communications and Multimedia Commission (MCMC). To operate an amateur radio station in Malaysia, an amateur radio operator must hold a proper Apparatus Assignment (AA) or a foreign amateur radio licensed from countries that have a reciprocal arrangement with Malaysia. Please refer to [Appendix 1](#) to obtain the list of countries that having a reciprocal arrangement with Malaysia.

About Amateur Radio

Amateur radio service is defined in the Communications and Multimedia (Spectrum) Regulations 2000 as **a radiocommunications 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 radio amateurs 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 the 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 a common frequency bands for amateur radio service internationally in a sharing basis to all amateur radio stations around the globe.

Things You Can Do With Amateur Radio

Amateur radio operators are often called "ham radio operators" or "hams". Activities that amateur radio operator's can do with their radios are diverse. The following list stated examples of their activities.

- 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 and 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 their own radios, transmitter, receiver and antennas.
- e) Communicate through orbiting satellites. Ham can use amateur satellites operated by the amateur community without any cost.
- f) Communicate with astronaut while orbiting the earth.
- g) Experiment with Amateur TV (ATV), Slow-Scan TV (SSTV), or send still-frame pictures by facsimile.
- h) Participate in transmitter hunt games or maybe build your own directional finding equipment.
- i) Participate in the activity of communication required for search and rescue activities.

Things 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 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.

Amateur Radio Operator's Certificate

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 the 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 are able to operate an amateur radio station in the correct and responsible manner required by the law.

There are two classes 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 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.

From 1st April 2007, pass in the Morse code practical examination will no longer be a requirement. However, practical examination will continue to be organised at a regular interval for those who require such recognition or skill.

Amateur Radio Operator's Certificate 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 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 MCMC. Application can be applied from any MCMC regional offices. A callsign will be issued to the successful applicant according to their AROC class. The ASAA authorized the holder to participate and operate an amateur radio station.

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

Amateur Station Apparatus Assignment

All amateur radio stations in Malaysia must be licensed by getting the proper ASAA from the MCMC as the authority for the communications industry in Malaysia. You need to obtain an ASAA to operate an amateur radio stations.

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 MCMC for details.

Eligibility for ASAA Application

To be eligible for ASAA application, applicant 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) Hold an AROC Class A or B or in lieu, a copy of Examination results issued by the MCMC.

Details requirement to apply for the ASAA is describe in "**Guideline for Apparatus Assignment**" published by the MCMC.

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 kilo meters 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

Reciprocal operating arrangement

Foreign amateur radio operator may apply for ASAA under the reciprocal arrangement between their country and Malaysia. MCMC 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 which ever is earlier.

Foreign amateur radio operator which came from country which have no reciprocal arrangement will be dealt on 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 MCMC.

Radio Amateur Examination (RAE)

The RAE is a written examination on the following topics:

- a) The fundamental theory of electricity, electronics and radiocommunications;
- 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. Candidates are given three hours to answer all questions. No marks are deducted for a wrong answer. Please refer to [Part C](#) for the details syllabus.

Morse Codes 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 MCMC. The notice or announcement will be made through a public notice in the local press and electronics media available. The notice will detail the terms and conditions, application procedures, payment mode and other related matters pertaining to the examination. Sample of the application form is shown in [Appendix 9](#) and will be available at all MCMC offices including its regional offices. Contact details of the MCMC and its regional offices are available in [Appendix 13](#).

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.

Minimum Age Requirement for the Examination

The minimum age limit for candidate to sit is 14 years for the RAE and 18 years for CW. 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.

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 describe 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 transmissions 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 MCMC. The content recorded shall be preserved for a period of at least two years. The station log book should records 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 MCMC to inspect and test their amateur radio station. MCMC 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 were 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 introduces the callsign 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) The use of word "BREAK" is only allowed to deliver 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 anytime 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 conditions 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.
- d) Using the PTT (press to talk) button is prohibited in performing this 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 (RM 300,000.00) 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 equipments, 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) You must responsible if your amateur radio station is found to be the caused of interference. Immediate remedy 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 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 alphabet is recommended to 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 and you shall not do in operating an amateur radio station.

- 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 which cause interferences.
- e) You should not retransmit programs or signals emanating from any types 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 (MCMC) 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 the fundamental theory of electricity, electronics and radiocommunications.

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 preset, 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:
 - iv) RF grounding;
 - v) station mains filtering;
 - vi) screening;
 - vii) monitoring output power and calculation of field strengths;
 - viii) monitoring output transmission for spurious and harmonic levels including key clicks;
 - ix) location of antennas and masts;
 - x) type and size of antennas; and
 - xi) 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;
- f) Setting up and use of an oscilloscope to examine and measure waveform and monitor the depth of modulation; and
- g) Use of dip oscillator.

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

Frequency Bands (in MHz)	Maximum Power Level (in Watts PEP)	Classes of Emission
1.8 - 2.0	25	A1A, A2A, A3E, F1A, F2A, F3E, J3E, R3E,
3.5 - 3.9	400	
7.0 - 7.1	400	
10.1 - 10.15	400	
14.0 - 14.35	400	
18.068 - 18.168	400	
21.0 - 21.45	400	
24.89 - 24.99	400	
28.0 - 29.7	400	
50.0 - 54.0	400	
144.0 - 146.0	400	
146.0 - 148.0	400	
430.0 - 440.0	100	
1,240 - 1,300	100	A1A, A2A, A3E, A3C, C3F, F1A, F2A, F3E, J3E, R3E
2,300 - 2,450	50	
3,300 - 3,500	50	
5,650 - 5,850	50	
10,000 - 10,500	50	
24,000 - 24,250	50	
47,000 - 47,200	50	
75,500 - 81,000	50	
119,980 - 120,020	25	
142,000 - 144,000	25	
144,000 - 149,000	25	
244,000 - 248,000	25	
248,000 - 250,000	25	

Class B privilege

Frequency Bands (in MHz)	Maximum Power Level (in Watts PEP)	Classes of Emission
28.0 - 29.7	50	A3E, F1A, F2A, F3E, J3E, R3E,
50.0 - 54.0	50	
144.0 - 146.0	50	
146.0 - 148.0	50	
430.0 - 440.0	50	

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 |

Symbol **Type of modulation of the main carrier**

M	iii) modulated in position/phase
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

<u>Symbol</u>	<u>Details of signal(s)</u>
L	Sound of commercial quality with separate frequency modulated signals to control the level of demodulated signal
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

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 MCMC.

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>FOKS</u> TROT
G	Golf	GOLF
H	Hotel	HOH <u>TELL</u>
I	India	<u>IN</u> DEE AH
J	Juliett	<u>JEW</u> LEE <u>ETT</u>
K	Kilo	<u>KEY</u> LOH
L	Lima	<u>LEE</u> MAH
M	Mike	MIKE
N	November	NO <u>VEM</u> BER
O	Oscar	<u>OSS</u> CAH
P	Papa	PAH <u>PAH</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>VIK</u> TAH
W	Whiskey	<u>WISS</u> KEY
X	X-ray	<u>ECKS</u> <u>RAY</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 Stop sending / I am leaving the air.
Usage (**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?
Stand by / I will call you again athours on KHz.
- QRZ ? : Who is calling me?
Voice You are being called by on KHz.
Usage (**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
Usage amateurs (the only type of one-way message allowed on amateur radio). "The following is a QST:".
- 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?
Voice
Usage
- Shall I (Will you) change frequency (to)?
I am changing frequency (to)
(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

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
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
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
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
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 extend, 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

- i) Thailand
- ii) Indonesia
- iii) Laos
- iv) Vietnam
- v) Myanmar
- vi) India
- vii) China
- viii) Mongolia
- ix) United Kingdom
- x) Republic Germany
- xi) Switzerland
- xii) Finland
- xiii) Czechoslovakia

Appendix 9: Sample of the RAE Application Form


Suruhanjaya Komunikasi dan Multimedia Malaysia
Malaysian Communications and Multimedia Commission
Aras 11, Menara Dato' Onn, Putra World Trade Center, 45 Jalan Tun Ismail, 50480 Kuala Lumpur.
Tel: (6) 03-4047 7000 Fax: (6) 03-2694 0908 Website: www.cmc.gov.my

PERMOHONAN PEPERIKSAAN RADIO AMATUR / UJIAN MORSE

MAKLUMAT PEMOHON									
NO. KAD PENGENALAN LAMA / PASPORT / KAD KUASA					TARIKH LAHIR (HH-BB-TTTT)		UMUR		
					- -		TAHUN		
NOMBOR KAD PENGENALAN BARU					BANGSA		KERAKYATAN		
- -									
NAMA PENUH PEMOHON									
ALAMAT SURAT-MENYURAT									
POSKOD									
BANDAR									
NEGERI									
NOMBOR TELEFON RUMAH			NOMBOR TELEFON PEJABAT			NOMBOR FAKSIMILI			
-			-			-			
NOMBOR TELEFON BIMBIT			PERKERJAAN						
-									
ALAMAT E-MAIL									

MAKLUMAT PERMOHONAN <i>Tandakan (X) dikotak bersesuaian</i>			
ORANG KURANG UPAYA	JENIS PEPERIKSAAN	TEMPAT PEPERIKSAAN	
☐ YA	☐ RADIO AMATUR (RAE)	☐ KUALA LUMPUR	☐ KOTA KINABALU
☐ TIDAK	☐ UJIAN MORSE	☐ PULAU PINANG	☐ KUCHING

DEKLARASI	
Saya _____ mengaku bahawa segala maklumat yang saya berikan dalam borang ini adalah benar, betul dan lengkap. Saya juga mengesahkan bahawa saya telah membaca dan memahami segala syarat-syarat permohonan seperti tertera pada mukasurat 2 (muka belakang) borang permohonan ini dan bersetuju untuk mematuhi segala syarat-syaratnya.	
Tanda Tangan Pemohon	Tarikh Permohonan

UNTUK KEGUNAAN PEJABAT			
TARIKH DITERIMA (HH-BB-TTTT)	DIPROSES OLEH	TARIKH DIPROSES	
- -			
SEMAKAN	PERMOHONAN INI	TEMPAT PEPERIKSAAN	NOMBOR INDEK
☐ Salinan K.P/Pasport/Kad Kuasa	☐ DILULUSKAN		
BAYARAN ☐ Ada ☐ Tiada	☐ GAGAL	TARIKH	MASA
☐ WPM ☐ BANK DRAF ☐ TIDAK LENGKAP			
NOMBOR BANK DRAF / WPM			
KEMASUKAN DATA OLEH			
NAMA _____			
TARIKH _____			
REMARK _____			
DISAHKAN OLEH _____ TARIKH _____			

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



SURUHANJAYA KOMUNIKASI DAN MULTIMEDIA MALAYSIA
Malaysian Communication and Multimedia Commission

Aras 11, Menara Dato' Onn, Putra World Trade Center, 45 Jalan Tun Ismail, 50480 Kuala Lumpur.
Tel: (6) 03-4047 7000 Fax: (6) 03-2694 0908 Website: www.cmc.gov.my

**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
Aras 12, Menara Dato' Onn, Putra World Trade Centre, 45 Jalan Tun Ismail 50480 Kuala Lumpur
Tel : 03-40477000 Fax : 6 03-26940943 <http://www.cmc.gov.my>

APPLICATION FOR APPARATUS ASSIGNMENT (S) (AMATEUR SERVICE)

☒ New apparatus		☐ Type of apparatus (Please refer to instructions):		Application Fee RM60 per application	
☐ Existing apparatus	Client ID no.:	Assignment no.(s):	Callsign:		

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

1. CLIENT INFORMATION							
Organization 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:		SAME AS ABOVE					
(if different from above)		Postal code:					
E-mail:	ahmad@yahoo.com	Telephone:	87878787	Fax:	87878788	Occupation:	ENGINEER
Passport / IC No:	800420-11-5037	Date of birth:	20-04-1980	Place of birth:	KUANTAN		
Citizenship:	☐ Malaysian		☐ Commonwealth		☐ 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:1		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):		__ 1 __ 0 __ 1 __ ° __ 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 DEC 2002	Date assignment is issued OR Date required 15 FEB 2003 (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:	Ahmad Ali	Date:	15 DEC 2002
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If applicant is under 21 years of age, counter signature of parent or guardian is required.

Note : Please enclosed

1. A sketch of the aerial(s) to be used.
2. Documentary proof of citizenship.
3. A copy of radio amateur proficiency certificate.
4. Letter of reference from Malaysian Amateur Radio Transmitting Society (MARTS)
5. A declaration of secrecy

FOR CMC USE ONLY

Fee paid:	
Cheque or Bank in slip no.::	
Fee paid:	

Appendix 12: Sample Letter of Reference

Date:

To:

The Chairman

Malaysian Communications and Multimedia Commission

Level 11, Menara Dato' Onn

Putra World Trade Center (PWTC)

45 Jalan Tun Ismail

50480 KUALA LUMPUR

Malaysia.

Dear Sir

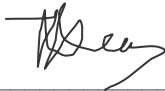
**APPLICATION FOR AMATEUR STATION APPARATUS ASSIGNMENT (CLASS A/B*)
FOR (Applicant Name), NRIC Number: (Applicant NRIC number)**

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

He *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: Mohamad Ariff Bin Mohd Nazir

Callsign: 9M2MA since 12.8.1998 (when you obtained the callsign)



2. _____

Name: Omar Bin Mohd Sanef

Callsign: 9M2OS since 30.10.1998 (when you obtained the callsign)

* delete where appropriate

Appendix 13: Contact Details of the MCMC and its Regional Offices

1. Head Quarters:

Malaysian Communications and Multimedia Commission

63000 Cyberjaya
Selangor Darul Ehsan
MALAYSIA

Contact us at:

Telephone: +603 8688 8000
Facsimile: +603 8688 1000
E-mail: webmaster@cmc.gov.my

For consumer complains call:

Free phone: 1 800 888 030

2. MCMC Regional Offices

Northern Regional Office

Unit 3, Level 11 Menara UMNO
128, Jalan Macalister
10400 Penang
Pulau Pinang

Tel: (604) 227 1657
Fax: (604) 227 1650

Eastern Regional Office

Level 2, Bangunan Tabung Haji
Jalan Bukit Ubi
25200 Kuantan
Pahang

Tel: (609) 512 1100 / 1119
Fax: (609) 515 7566

Southern Regional Office

Suite 7A, Level 7
Menara Ansar
Jalan Trus
80000 Johor Bahru
Johor

Tel: (607) 226 6700
Fax: (607) 227 8700

Sabah Regional Office

Level 8, Wisma BSN
Jalan Kemajuan
Kamarunsing
88000 Kota Kinabalu
Sabah

Tel: (6088) 268 978

Fax: (6088) 253 205

Sarawak Regional Office

Level 5 (North), Wisma STA
26, Jalan Datuk Abang Abdul Rahim
93450 Kuching
Sarawak

Tel: (6082) 331 900

Fax: (6082) 331 901

Central Regional Office

Level 17, Wisma Masalam
1, Jalan Tengku Ampuan Zabedah C9/C
Section 9
40100 Shah Alam
Selangor.

Tel: (603) 5518 7701

Fax: (603) 5518 7710