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RADIO AMATEUR EXAM
GENERAL CLASS

By **4S7VJ**

CHAPTER- 8 LICENCING CONDITIONS, OPERATING PRACTICES AND PROCEDURES

8.1 Introduction

Amateur Radio service is a scientific hobby, a means of gaining personal skill in the fascinating art of electronics and an opportunity to communicate with friends all around the world by private short wave transceiver. Scattered over the globe are over 10 million Amateur Radio operators who perform a services defined in international law as one of "self training, intercommunication and technical investigations carried on by duly authorized persons interested in radio technique solely with a personal aim and without pecuniary interest."

8.2 Emission Designators

One result of the **W**orld **A**dministrative **R**adio **C**onference held in 1979 (**WARC** '79) was the adoption of a new system of designating emissions according to there necessary bandwidth and their classification.

Emission designator is a kind of an abbreviation with three characters.

Type of emissions are classified by the following characteristics:

8.2.1 First character – a letter

(Type of modulation of the main carrier)

N – Emission of an un-modulated carrier
A – Double Side Band (DSB)
B – Independent sidebands
C – Vestigial sideband
D – Emission in which the main carrier is amplitude and angle modulated either simultaneously or in a pre established sequence.
F – Frequency Modulation (FM)
G – Phase Modulation (PM)
H – SSB full Carrier
J – SSB Suppressed carrier
K – A sequence of pulses modulated in amplitude.
L – A sequence of pulses modulated in width/duration.

M - A sequence of pulses modulated in position/phase.

P – Sequence of un-modulated pulses
Q - A sequence of pulses modulated in which the carrier is angle modulated during the period of the pulse
R – SSB Reduced or Variable Level Carrier

X – Cases not otherwise covered

8.2.2 Second character – a Number
(Nature of signal modulating the Main Carrier)

0 – No modulating Signal
1 – A single channel containing Digital Information without the use of a Modulating Sub-Carrier
2 - A single channel containing Digital Information with the use of a Modulating Sub-Carrier
3 - A single channel containing Analog Information
7 – Two or more channels containing digital information.
8 – Two or more channels containing analog information
9 – Composite system with one or more channels containing digital information together with one or more channels containing analog information
X – Cases not otherwise covered

8.2.3 Third character – a letter
(Type of information to be transmitted)

N – No Information transmitted
A – Telegraph for aural reception
B - Telegraph for automatic reception
C – Facsimile (Fax)
D – Data transmission
E – Telephony (including sound broadcasting)
F – Television (video)
W – Combine of the others
X – Cases not otherwise covered

There are two optional characteristics may be added for a more complete description of an emission.
4th Character (a letter) – details of signal
5th Character (a letter) – Nature of Multiplexing

8.2.4 Emission Types (summary)
Emissions may also be referred to by the following emission types:

CW – First Symbol: A,C,H,J,R
Second Symbol: 1

Third Symbol: A,B

MCW

First Symbol: A,B,C,D,F,G,R
Second Symbol: 2
Third Symbol: A,B

Phone

First Symbol: A,C,D,F,G,H,J,R
Second Symbol: 1,2,3
Third Symbol: E

RTTY or Data

First Symbol: A,C,D,F,G,H,J,R
Second Symbol: 1,(2,7,9 above 51 MHz)
Third Symbol: B(RTTY) or D(data), W (above 51MHz)

Examples:

The most of Radio Amateurs and listeners use the following emissions:
A1A – Normal CW (Morse) on HF bands
J3E – Normal SSB on HF bands
F3E – VHF & UHF FM voice communication
A3E – Normal AM voice communication in HAM Radio

8.3 Regulations

Licence for the importation, installation, establishment, maintenance, possession, or operation of radio communication equipment in the **amateur radio service** shall be granted subject to the following conditions:-

8.3.1 Application

Any person desirous of obtaining a Licence for the above purposes (importation, installation, establishment, maintenance, possession, operation) shall make an application to the director of telecommunication in the form provided for such purpose.

8.3.2 Applicant

(a) The applicant shall not less than **16 years** of age
(b) The applicant shall satisfy the Director of Telecommunication, that he is technically competent to operate an Amateur Radio Station.
(c) The applicant has passed the written examination.

(d) The advanced class applicants has passed the practical Morse Code test conducted by the Director of Telecommunication.

8.3.3 Issuing the licence

After considering the particulars set out in the application the Director of Telecommunication shall issue:-

(a) a Novice Class Amateur Licence; or

(b) a General Class Amateur Licence; or

(c) an Advance Class Amateur Licence

to the applicant on payment of the fees published by TRCSL.

8.3.3.1 Call-Sign

(a) The Director of Telecommunications shall assign a call sign to each amateur radio station along with the licence.

(b) The call sign shall be transmitted at the beginning and end of each transmission.
In case of transmission of longer duration the call-sign shall be transmitted **once in every five minutes.**

8.3.4 Validity and Renewal

Normally every licence valid for a period of one year and be renewed annually. But it can be renewed maximum of five years at a time. Application for renewal shall be made in the form provided for such purpose.

8.3.5 Novice Class Licence

The Novice Class Amateur Licence shall be subject to the following conditions:-

(a) Transmission shall be only in the frequency bands allocated in table 8.1

HF-Bands:-

The rated peak envelop output power from the final stage shall not exceed **100 watts for J3E** and **50 watts** mean power output on other emissions on HF bands.

VHF-Band:-

The rated output power from the final stage shall not exceed 10 watts for all emissions on VHF band (144-146 MHz)

Table-8.1

Radio frequency allocations for Novice-class

Frequency Band	Status	Class of emission
3.5 – 3.6 MHz	Primary	A1A, A1B, A2A, F1A
21.125 – 21.200 MHz	Exclusively use by Amateur Radio Service only	A1A, A1B, A2A, F1B J2A, J2B, J3E
28.000 – 28.500 MHz	Exclusively use by Amateur Radio Service only	A1A, A1B, A1C, A1D
144 – 146 MHz	Exclusively use by Amateur Radio Service only	F3E, F2A, A1A, A1B,A2A, F3F

8.3.6 General Class Licence

The general Class Licence shall be subject to the following conditions:-

(a) Transmission shall be only in the frequency bands allocated **Table 8.2.**

(b) The rated peak envelope output power from final stage shall not exceed **500 watts for J3E and 250 watts** mean power output for other emissions on **HF bands.**

(c) The rated output power from final stage shall not exceed **25 watts** for all emissions on **VHF and above.**

8.3.7 Advanced Class Licence

The Advanced Class Licence shall be subject to the following conditions:-

(a) Transmission shall be only in the frequency bands allocated **Table 8.2.**

(b) The rated peak envelope output power from final stage shall not exceed **1000 watts for J3E and 500 watts** mean power output for other emissions on **HF bands.**

(c) The rated output power from final stage shall not exceed **50 watts** for all emissions on **VHF and above.**

(d) An amateur radio licence issued prior to the coming into operations of these regulations and which

is not revoked shall be **consider to be a General Class Amateur Licence** issued under these regulations.

Table-8.2
Radio Frequency allocation
General and Advanced Class

Frequency Band (MHz)	Status	Class of Emission
1.800 - 2.000	Primary service	A1A, J3E
3.500 – 3.900	Primary service	A1A,A1B,A1C,A1D, A2A, J3E
7.000 – 7.100	Exclusively use by Amateur Radio Service only	A1A,A2B, A2C, A2D, J3E,A3E, A3C
10.100 –10.150	Secondary service	A1A,A1B
14.000–14.350	Exclusively use by Amateur Radio Service only	A1A, F1A, F1B J3E, J3F, R3E,
18.068 –18.168	Exclusively use by Amateur Radio Service only	A1A,F1C, F2A, F2C, F2D, F3C
21.000–21.450	Exclusively use by Amateur Radio Service only	A1A,J3E, F3E, F3F
24.890 –24.990	Exclusively use by Amateur Radio Service only	A1A
28.000- 29.700	Exclusively use by Amateur Radio Service only	A1A, J3E

Frequency Band	Status	Class of Emission
50 – 54 MHz	Exclusively use by Amateur Radio Service only	A1A, A1B, A1C, A1D, A2A
144 – 146 MHz	Exclusively use by Amateur Radio Service only	A1A, A2B, A2C, A2D A3C, A3E, J2B, J2C J3C, J3E, J3F, R3E F1A, F1B, F1C, F1D F2A, F2B, F2C, F2D F3C, F3E, F3F
430 – 440 MHz	Secondary service	A1A, A1B, A1C, A1D
1240–1300 MHz	Secondary service	A2A, A2B, A2D, A3C, A3E
2300-2450 MHz	Secondary service	A3F, J2A, J2B, J2C
3300-3500 MHz	Secondary service	J2D

5650-5850 MHz	Secondary service	J3E, J3F
10 – 10.5 GHz	Secondary service	F1A, F1B, F1C
24 – 24.05 GHz 24.05-24.25GHz	Exclusively use by Amateur Radio Service only Secondary service	F1D F2A, F2B, F2C, F2D
47 – 47.2 GHz	Exclusively use by Amateur Radio Service only	F3C, F3E
75.5 – 76 GHz 76 – 81 GHz	Exclusively use by Amateur Radio Service only Secondary service	F3C, F3E F3F
122.25-123GHz	Secondary service	
134 – 136 GHz 136 – 141 GHz	primary service Secondary service	
241 – 248 GHz 248 – 250 GHz	Secondary service Exclusively use by Amateur Radio Service only	

8.3.8 Licence for foreigners

(a) A non-national who hold a licence to operate an amateur radio station shall be issued a licence to operate an amateur radio station while in Sri-Lanka. The category of the licence to be issued shall be based on the licence held by him.

(b) The licence issued under above paragraph shall be valid for the period stated in the licence and on payment of the fee as published by TRCSL.

8.3.9 Club Stations

An organization registered with the government which has as its objects, radio investigation or research or the training of persons in radio communication techniques may be granted a licence to operate a radio station in the amateur radio service, subject to the following conditions:-

(a) The Director of Telecommunication shall be satisfied that the organization is a teaching institution recognized by the government and a bona-fide organization with the above mentioned object.

(b) A person nominated by the organization and approved by the Director of Telecommunication shall be responsible for the security of the equipment and the proper operation of the station.

(c) The station shall be operated by or in the presence of a person holding a current amateur radio licence issued under these regulations, subject to the conditions of such licence and of the licence issued to the station.

(For the purpose of this paragraph organization shall include a school, College, Institute or Association.)

8.3.10 Location

An amateur licence authorized the licensee to operate the station at the premises specified in the licence. However the licensee can operate in another premises for a specified period with the prior approval of the Director of Telecommunications.

8.3.11 Mobile Licence

The Director of Telecommunications may, on application authorize any person;

(a) holding an amateur radio licence, to install an amateur radio station in a vehicle and operate such station in Amateur Frequency Bands above 30 MHz as maybe specified by him.

(b) Holding a General or Advanced Class licence to operate on an ocean going ship or a vessel or an air-craft in flight, provided that such operation shall in addition to these regulations, be subject to the rules and regulation imposed by the authorities concerned with those mode of transport.

8.3.12 Emergency

The Director of Telecommunication may permit or civil licenced Amateur Radio Operators to participate

in special amateur radio communication network in the event of natural disaster emergency.

8.3.13 Log Book

A person who holds a valid amateur radio licence shall Maintain a station Log Book with consecutively numbered pages in which all emissions shall be entered in indelible writing.

The records on each transmission shall include the following details.

1. **Date,** Month and Year of the transmission.
2. The beginning and end of the radio communication or the emission in **UTC.**
3. The **call-sign** of the called station.
4. The **frequency** band.
5. The type of **emission.**
6. The **location** of the station contacted.

8.3.14 Interference

(a) A person who holds a valid amateur radio licence shall ensure that the antenna and other accessories of the amateur station is properly designed and constructed so that no interference is caused to the transmission and reception of any other station or service or to the reception of sound broadcasting or television broadcasting.

(b) When a person who hold a licence is aware of any interference to other services he shall take such resonable steps to rectify the problem.

(c) Where a complaint has been lodged with the Director of Telecommunications regarding any interference with any other service he shall investigate into such complaint and where he is satisfied that there is an interference he shall inform the holder of the licence to take appropriate steps to rectify the problem.

(d) A person who holds a valid amateur radio licence shall Immediately change the equipment, antenna, earth wire and other accessories at his own expense in the event of any damage or

obstruction to the Telecommunications installations serving public purpose.

(e) A person who holds a valid amateur radio licence shall the Earth wire of an amateur radio station shall not be interconnected with the Telecommunication installation having public purpose.

(f) Transmission lines of an amateur radio station will only be permitted to cross Telecommunication installations with the consent of the regional Telecommunication engineer of the area where the installation is located.

(g) The equipment and other accessories of the station shall be installed and maintain according to the accepted international safety standards.

8.3.15 Repeater and Beacon

(a) The Director of Telecommunication may grant approval to an Associations to which a licence has been granted to operate a Repeater or Translator or Beacon installations.

(b) The Repeater or Translator or Beacon approved under above paragraph shall be freely accessible to all persons who hold a licence to operate an amateur radio station.

(c) In the event of any interference caused to other radio communication services or stations, the Director of telecommunication shall order to terminate the operation of such equipment.(repeater / translator / beacon)

8.3.16 Type of message and Language

(a) Radio communication between Amateur Stations shall be made in plane language. The amateur codes and the operational abbreviations internationally used, shall be regarded as plain language.

(b) The transmission shall be limited to message of a technical nature relating to test themselves and to remarks of personal nature for which, because of their minor importance recourse to the public telecommunication service would not be justified.

8.3.17 Not to Do

A person who holds a licence to operate an Amateur Radio Station shall not:

(a) exchange messages **not relating to amateur radio** which either originate from or delivered for a third party.

(b) exchange messages whose contents are against the law or **danger for public order and security.**

(c) Use **offensive and abusive** language.

(d) Exchange messages with a person **who don't have an amateur radio licence.**

(e) Operate for periods **exceeding five minutes** without mention the call sign.

(f) Operate for periods **exceeding ten minutes** of uninterrupted transmission.

(g) Any communication with amateur stations of different countries, **if the administration of one of the countries concerned has notified that it object to such operations.**

(h) Transmit/receive on **other radio frequency bands** without a valid licence relevant to the radio stations in that particular service.

(i) Transmit music or other kind of broadcast entertainment and every kind of advertising. The transmission of a sequence of tones shall only be permitted for checking and measuring purposes **for a maximum duration of two minutes.**

(j) Omit **misleading signals** or call-signs.

(k) Transmit the **words of a third party** which have not been publicly spoken.

8.3.18 Testing

(a) Emission of an unmodulated or unkeyed carrier shall only be permitted for a short duration and only testing and tuning purposes.

(b) For test, adjustment and measurements of the transmitter, terminating resistor (Dummy Load) shall be used. Effective screening arrangements shall also be employed to safeguard against illegal radiations.

(c) An amateur radio station shall not be interconnected with other telecommunication installations either electrically or acoustically.

8.3.19 Inspection of the station

(a) The radio communication equipment, log-books and other accessories of an amateur radio station shall be available for inspection at any time by an officer authorized by the director of telecommunications.

(b) Any person who obstructs any officer referred to in above paragraph in the course of his duties shall be guilty of an offence.

(c) The log book must keep safely at least **one year** after the last entry for inspection.

8.3.20 Distress Signals

(a) A person who holds a licence to operate an amateur radio station shall receive distress signals from other stations, all requests for distress, answer such signals, and retransmit them with the least possible delay, by any means to the relevant authorities.

(b) A person who holds a licence to operate an amateur radio station **not to Use** of international distress signal **"sos" or "MAYDAY".**

8.4 operating procedures

8.4.1 Station Set up

Before construct or buy transmitting equipments, any Amateur Radio Operator should have a valid Amateur Radio licence, issued by the Director of Telecommunication.

After the installation of Amateur Radio transmitting equipments and proper antenna system, carefully listen the band before transmit.

8.4.2 HF Operation

Select a clear frequency and check SWR. If the SWR is greater than 3 (3:1) **do not transmit** and check the antenna system or tune the ATU, if ATU is using. Always better to use properly matched antenna system, without having an ATU. If the SWR is less than 1.5, it is very good, less than 1.1 is excellent.

8.4.2.1 CW Operation

CW operation is very important in ham radio, because:

1. Construction of a CW transmitter is very easy.
2. Coping a CW signal easier than a voice signal even with a very poor band condition and with heavy QRM or QRN.
3. It is occupying a very narrow bandwidth.
4. We can consider CW as a universal language because any amateur radio operator can communicate with using Q-code and abbreviations even with a poor knowledge of English.

8.4.2.2 CQ call

The meaning of CQ is "**If anyone can hear me please response**"

There are important rules to be observed when putting out a CQ call. Some of the more vital ones are as follows:

1. Listen on the chosen frequency to make sure that it is quite clear of other signals before press the key (before transmit)
2. When using telephony confirm the above statement by asking **"Is anyone using this frequency please?"** or **"Is this frequency in use?" or "Is this frequency occupied"** several times, and then listen very carefully for replies before initiate the "CQ" call.
3. When using CW you can send "QRL ?" or just a "?" (di di dah dah di dit) several times.
4. Keep call short and listen frequently for replies. When using telephony **speak slowly and clearly.**
5. The ideal arrangement is to use "full break-in" on CW and "vox" when on ssb so that it is possible to "listen through" one's calls.
6. Do not use more than three "CQs" followed by one's own callsign given twice. This being repeated until a contact is established.

8.4.2.2.1 Examples for CQ callS

1. CQ call on CW operation:

CQ CQ CQ DE 4S7VJ 4S7VJ +K*(Repeat if no response)*

4S7VJ 4S7VJ DE G3KTR G3KTR +K

G3KTR DE 4S7VJ =
GE OM ES MNI TKS FER CALL =
UR RST 579 579 =
QTH NR COLOMBO =
NAME WIJE =
G3KTR DE 4S7VJ K

4S7VJ DE G3KTR =
RR GE WIJE ES MNI TKS FER 579 =
UR RST 559 559 =
MY NAME IS TONY TONY =
QTH 100KM N OF LONDON LONDON =
RIG HR FT101 ES ANT 3EL 3B YAGI =
WX TEMP 15C =
PSE QSL = MY QSL VIA BURO =
4S7VJ DE G3KTR K

G3KTR DE 4S7VJ =

RR DR TONY FB TKS =
RIG HR IS HB TX WID 75WATTS ES AR88 RX ANT DIPOLE =
MY QSL OK VIA BURO =
WX HR IS WARM TEMP 27C =
FB TKS FER NICE QSO CUAGN GUD DX 73 73 =
G3KTR DE 4S7VJ VA

4S7VJ DE G3KTR =
TKS ES HPE CUAGN 73 73 =
4S7VJ DE GEKTR VA

2. CQ call on SSB

CQ CQ CQ THIS IS FOUR SIERRA SEVEN VICTOR JULIETT FOUR SIERRA SEVEN VICTOR JULIETT CALLING AND STANDING BY
(if no response repeat several times)

4S7VJ 4S7VJ THIS IS VICTOR UNIFORM TWO ROMEO X-RAY VICTOR UNIFORM TWO ROMEO X-RAY STANDING BY

VU2RX THIS IS 4S7VJ GOOD MORNING OLD MAN THANKS FOR COMING BACK TO MY CALL YOU ARE FIVE AND EIGHT FIFTY EIGHT AND QRN HEAR
MY HANDLE IS WIJE WHISKEY INDIA JULIETT ECHO AND QTH NEAR COLOMBO
VU2 ROMEO X-RAY THIS IS 4S7 VICTOR JULIETT

4S7 VICTOR JULIETT THIS IS VU2 ROMEO X-RAY
GOOD MORNING WIJE THANKS FOR FIVE AND EIGHT REPORT AND YOU ARE FIVE NINE PLUS TEN DB OVER NINE
MY HANDLE IS VASANTH VICTOR ALFA SIERRA ALFA NOVEMBER TANGO HOTEL AND QTH IS BOMBAY
4S7VJ VU2RX

VU2RX 4S7VJ
ROGER VASANTH THANKS FOR THE QSO AND THANKS FOR NICE REPORT SEE YOU AGAIN SEVEN THREE AND GOOD DAY
VU2RX 4S7VJ CLEAR

73 WIJE
4S7VJ VU2RX CLEAR

8.4.2.3 Directional call

1. Directional CQ-call

If contact with a specific area is desired it is a good idea to put out a directional CQ call

For example on CW:-

CQ USA CQ USA CQ USA DE 4S7RS +K (4S7RS calling for USA stations only)

or CQ VK CQ VK CQ VK DE 4S7RS (for Australia only)

or CQ DX CQ DX CQ DX DE 4S7RS (for long distance only)

For example on SSB:-

CQ W CQ W CQ W THIS IS 4S7RS (4S7RS calling for USA only)

or CQ EUROPE CQ EUROPE....(for Europe only)

or CQ DX CQ DX CQ DX... (for long distance only)

2. Directional call for a specific station

If you like to have a QSO with a particular station, for example 4S7RS like to contact VU2RX:

for CW QSO:-

VU2RX VU2RX DE 4S7RS 4S7RS PSE K

for SSB QSO:-

VU2RX VU2RX this is 4S7RS Calling and standing by

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EXERCISES

8.1 What are the HF bands allocated for amateur radio operations?

8.2 State under what conditions an amateur radio operator allowed to use an HF/VHF receiver for his purpose.

8.3 What are the parameters of an amateur station that should not be changed for operation from the specific

limits without prior permission from the Director General of telecommunication?

8.4 Write short notes on:
(a) procedure for establishing a radio contact.
(b) Procedure for CQ call.

Select the correct answer:

8.5 The type of emissions permitted for 14.100 to 14.350MHz are
(a) A1A (b) J3E (c) A1B
(d) all above are correct