

Public Consultation on the Draft Technical Standards for Amateur Radio Service in Saint Lucia

Overview

In order to properly oversee Amateur Radio Service operations in Saint Lucia, clear technical standards must be adopted to guide the public, specifically existing and prospective equipment users, importers and vendors. In the absence of such, the Commission has prepared the Draft Technical Standards for Amateur Radio Service in Saint Lucia.

Public Consultation Process

1. The Commission invites comments from the general public and specifically, existing and prospective Amateur Radio Service operators, equipment importers and vendors, on the Draft Technical Standards for Amateur Radio Service.
2. The Public Consultation process will follow the Commission's *Guidelines for Conducting Public Consultations*, which can be summarised as follows.
 - (a) It is a two-tiered Public Consultation which will last up to eighty-four (84) days, with the following proposed timeline:

	Activity	Dates
1.	The Commission publishes Consultation Document	January 24 th 2008
2.	Responses are submitted to the Commission on the consultation document (1 st round of responses, 6 weeks)	March 5 th 2008
3.	The Commission circulates and invites comments on the responses	March 7 th 2008
4.	Further comments are submitted to the Commission (2 nd round of responses, 3 weeks)	April 1 st 2008
5.	The Commission publishes the <i>Technical Standards for Amateur Radio Service in Saint Lucia</i>	April 29 th 2008

(b) The Commission requests:

(i) Comments on the initial consultation document (1st round), which should be received by the Commission by **Wednesday, March 5th, 2008**; and

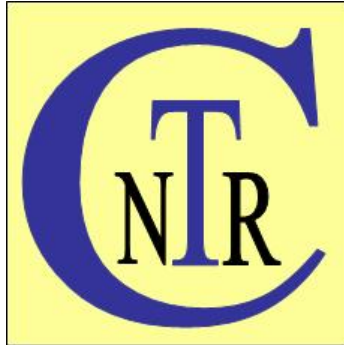
(ii) Comments on the views submitted in respect of the consultation document (2nd round), which should be received by the Commission by **Tuesday, April 1st, 2008**.

(c) Views can be shared on any aspect of the Consultation Document, and in so far as it is possible, each paragraph has been numbered to facilitate easy reference.

3 All responses must be in writing in order to be considered by the Commission, labelled **“Comments on the Draft Technical Standards for Amateur Radio Service”** and should be forwarded to

The Coordinator
National Telecommunications Regulatory Commission
Global Tile Building (Bois d’Orange)
P. O. Box GM 690
Castries
St. Lucia

Fax: (758) 453 2558
Email: ntrc_sluc@candw.lc



Draft Technical Standards for Amateur Radio Service

NATIONAL TELECOMMUNICATIONS REGULATORY COMMISSION

SAINT LUCIA

TABLE OF CONTENTS

1.0 SCOPE 1

2.0 RESOURCES 1

3.0 DEFINITION OF TERMS..... 1

4.0 ROLE OF THE COMMISSION 6

5.0 ACCEPTIBILITY OF EQUIPMENT 6

6.0 TECHNICAL REQUIREMENTS OF TRANSMITTERS 6

 6.1 FREQUENCY BANDS, TRANSMISSION POWER LEVEL AND MODES OF
 OPERATION 6

 6.2 EMISSION CLASS 8

 6.3 BANDWIDTH 9

 6.4 SPURIOUS EMISSION LIMITS 10

 6.5 FREQUENCY TOLERANCE 11

7.0 TECHNICAL REQUIREMENTS OF RECEIVERS..... 11

 7.1 SPURIOUS RESPONSE REJECTION 11

 7.2 RECEIVER SENSITIVITY 11

8.0 ANTENNAS AND AERONAUTICAL OBSTRUCTION CLEARANCE 11

ANNEX A i

1.0 SCOPE

- 1.0.1 This document sets out the technical standards for the transmitters and receivers operating in the Amateur Radio Service. The technical standards include acceptability of equipment, permissible frequency bands, transmission power and other technical specifications applicable to the amateur radio service. These standards are industry standards applicable to equipment intended for use in Saint Lucia.
- 1.0.2 In the event of any inconsistencies between this document and the Act or Regulations, the provisions of the Act or applicable Regulations shall take precedence.

2.0 RESOURCES

- 2.0.1 Material from the following sources was used to compile this document:
- The Telecommunications Act 2000;
 - The National Telecommunications Regulatory Commission Procedures Manual;
 - The Framework For Amateur Radio Operations in Saint Lucia;
 - The Code of Federal Regulations (Title 47, Part 97);
 - Industry Canada (RIC-2);
 - International Telecommunications Union Radio Regulations 2004 Edition (Article 25; Appendix 1);
 - Australia Communications and Media Authority Operating Procedures for Amateur Radio Service.

3.0 DEFINITION OF TERMS

Act: The Telecommunications Act [No. 27 of 2000] in the jurisdiction of Saint Lucia.

Amateur Radio: A radio communications service for the purpose of self-training, intercommunications and technical investigations carried out by amateur, that is duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest.

Amateur Radio Licence: A licence issued to an amateur radio operator that specifies the class of amateur radio operations granted and associated privileges and/or permits to use and be in possession of telecommunications equipment required to engage in amateur radio operations.

Amateur Radio Operator: A person holding an amateur radio licence permitting the operation of an amateur radio station.

Amateur Radio Operations: Radio communications for the purpose of self-training intercommunications and technical investigations carried out by an amateur that is a duly

authorised person interested in radio technique solely with a personal aim and without pecuniary interest.

Amateur Radio Station: A station licensed for amateur radio operations, which includes the required equipment.

Applicant: A person applying for a licence or a frequency authorisation under the Act.

Application: An application for a licence or frequency authorisation, including a modification or renewal of a licence or a frequency authorisation, under the Act.

Application fees: The fees payable by applicant for a licence or frequency authorisation.

Authorized Bandwidth: The maximum permissible bandwidth of a transmission.

Auxiliary Station: An amateur radio station, other than a message forwarding system, transmitting communication point-to-point within a system of co-operating amateur radio stations.

Band: A range of frequencies.

Bandwidth: The width of a frequency band (outside of which the mean power of the transmitted signal is attenuated at least 26 dB below the mean power if the transmitted signal is within the band).

Beacon: An amateur station transmitting communications for the purpose of observation, propagation and reception or other related experimental activities.

Broadcasting: The transmission intended for reception by the general public, either direct or relayed.

Call sign: A series of unique letters and numbers assigned to a person who has obtained an amateur radio licence.

Commission: The National Telecommunications Regulatory Commission, established under section 8 of the Act

Control Operator: An amateur radio operator designated by the licensee of the amateur radio station to be responsible for transmission from that amateur radio station to ensure compliance with the operating rules and limits. In most cases, the control operator is the licensed amateur radio operator, except in cases when an amateur radio licence has been granted to an amateur radio club, association or other recognised group.

CW: An abbreviation for continuous wave; another name for Morse Code telegraphy by radio.

Data: Telemetry, telecommand and computer communications emissions having designations with A, C, D, F, G, H, J or R as the first symbol; 1 as the second symbol; D as the third symbol; and including emissions J2D.

dB: An abbreviation for decibel.

DX: An amateur radio abbreviation for distance or foreign countries.

ECTEL: Eastern Caribbean Telecommunications Authority

Emergency communications: Communications that take place during situations where there is danger to lives and/or property.

E.R.P.: An abbreviation for Effective Radiated Power. The product of the power supplied to the antenna and its *gain relative to a half-wave dipole* in a given direction.

FM: Abbreviation for frequency modulation. It is form of modulation that conveys information over a carrier wave by varying its frequency.

Frequency Allocation Plan: A Plan which shows the frequencies to be used in particular areas without specifying the stations to which the frequencies are to be assigned.

Frequency Authorisation: Means an authorisation granted by the Minister under section 36 to use radio frequencies in connection with the operation of a network or the provision of services under an individual licence or class licence or otherwise.

Frequency Tolerance: The maximum permissible departure by the centre frequency of the frequency band occupied by an emission from the assigned frequency. The frequency tolerance is expressed in parts in ppm or in hertz.

FSTV: An abbreviation for Fast Scan Television. It is a mode of operation in which amateur radio operators transmit broadcast-quality video and audio from their station to other amateur stations. It is also known as Amateur television (ATV).

Harmful interference: Any radiation or induction which endangers the functioning of radio navigation service or of a safety service or obstructs or repeatedly interrupts a radio service operating in accordance with the approved Table of Frequency Allocation and with the Telecommunications (Spectrum Management) Regulations, 2002.

HF: An abbreviation for High Frequency. Refers to the band of frequencies that range from 3 MHz to 30 MHz.

Interference: The effect of unwanted energy due to one or a combination of emissions, radiations, or inductions upon reception in a radiocommunication system, manifested by any performance degradation, misinterpretation, or loss of information which could be extracted in the absence of such unwanted energy.

Licence: Means an individual or a class licence.

Minister: Minister responsible for Telecommunications.

MF: An abbreviation for Medium Frequency. Refers to the band of frequencies that range from 300 kHz to 3000 kHz.

Mode: A type of amateur radio communication. Examples include Frequency Modulation, Slow-scan Television (SSTV) and Single Sideband (SSB).

Morse Code: A communication mode transmitted by on/off keying of a radio signal.

Out-of-band emission: Emission on a frequency or frequencies immediately outside the necessary bandwidth which results from the modulation process, but excluding spurious emissions.

PEP: An abbreviation for Peak Envelope Power. The average power supplied to the antenna transmission line by a transmitter during one RF cycle at the crest of the modulation envelope taken under normal operating conditions.

Phone: Emissions carrying speech or other sound information having designators with A, C, D, F, G, H, J or R as the first symbol; 1, 2 or 3 as the second symbol; E as the third symbol. Also includes speech emissions having B as the first symbol; 7, 8 or 9 as the second symbol; E as the third symbol.

Plan: Frequency Allocation Plan.

PM: An abbreviation for Phase Modulation. It is a form of modulation that represents information as variations in the instantaneous phase of a carrier wave.

ppm: An abbreviation for parts per million.

Pulse: Emissions having designators K, L, M, P, Q, V or W as the first symbol; O, 1, 2, 3, 7, 8, 9 or X as the second symbol; A, B, C, D, E, F, N, W or X as the third symbol.

Regulations: Refers to the Regulations that have been made under the Telecommunications Act, No 27 of 2000 in the jurisdiction of Saint Lucia.

Repeater: An amateur radio station, usually located at elevated sites for the purpose of receiving and simultaneously retransmitting of signals from other amateur radio stations on a different channel for extending the range of communications.

RF: An abbreviation for radio frequencies.

RTTY: An abbreviation for Radioteletype. It is a narrow band direct-printing telegraphy emissions having designators with A, C, D, F, G, H, J or R as the first symbol; 1 as the second symbol; B as the third symbol; and emission J2B.

SHF: An abbreviation for Super High Frequency. Refers to the band of frequencies that range from 3 GHz to 30 GHz.

SINAD: Is the abbreviation for signal-plus-noise-plus-distortion to noise-plus-distortion ratio. SINAD is usually expressed in decibels.

Spurious Emission: Emission on a frequency or frequencies which are outside the necessary bandwidth and the level of which may be reduced without affecting the corresponding transmission of information. Spurious emissions include harmonic emissions, parasitic emissions, intermodulation products and frequency conversion products, but exclude out-of-band emissions.

Spurious Response Rejection: Is a measure of the capability of the receiver to discriminate between the wanted modulated signal at the nominal frequency and an unwanted signal at any other frequency at which a response is obtained.

SSB: Single Side Band Modulation is a refinement of the technique of amplitude modulation designed to be more efficient in its use of electrical power and bandwidth.

SSTV: An abbreviation for Slow-scan Television. A mode of operation in which amateur radio operators exchange still pictures from their station.

Telecommand: A one way transmission to initiate, modify or terminate functions of a device at a distance.

Telecommunications: Any form of transmission, emission or reception of signs, texts, images and sounds or other intelligence of any nature by wire, radio, optical or other electromagnetic means.

Telemetry: A one-way transmission of measurements at a distance from the measuring instrument.

Transmitter: Any apparatus that converts electrical energy received from a source into radio frequency energy capable of being emitted.

UHF: An abbreviation for Ultra High Frequency. Refers to the band of frequencies that range from 300 MHz to 3000 MHz.

Unwanted emissions: Spurious emissions and out-of-band emissions as defined in is section.

VHF: An abbreviation for Very High Frequency. Refers to the band of frequencies that range from 30 MHz to 300 MHz.

4.0 ROLE OF THE COMMISSION

4.0.1 The National Telecommunications Regulatory Commission (NTRC) was established under the Telecommunications Act 2000 to regulate the telecommunications sector in Saint Lucia. Based on the functions of the Commission as outlined in section 12 of the Act, and relevant to the amateur radio service, the Commission is required to:

- (i) be responsible for technical regulations and the setting of technical standards of telecommunications and ensure compatibility with the Regional Spectrum Plan;
- (ii) plan, supervise and manage the use of the radio frequency spectrum in conjunction with ECTEL, including the assignment and registration of radio frequencies to be used by all stations operating in St. Lucia or on any ship, aircraft or other floating or airborne contrivance or spacecraft registered in Saint Lucia.

5.0 ACCEPTIBILITY OF EQUIPMENT

5.0.1 The telecommunications equipment intended for use in the Amateur Radio Service must have Type Approval certificate granted by the Commission and must meet the requisite technical standards established for operation in Saint Lucia.

6.0 TECHNICAL REQUIREMENTS OF TRANSMITTERS

6.1 FREQUENCY BANDS, TRANSMISSION POWER AND MODES OF OPERATION

6.1.1 The authorised frequency bands, maximum transmission power level and the modes of operation for transmitters operating in the amateur radio service are outlined in table 6.1. The specifications for transmission power indicate the maximum transmission power allowed for any amateur station operating in the bands authorised of amateur radio service.¹ Amateur radio service allocated as a primary service is duly authorised to use the specified frequency bands. Amateur radio service allocated under secondary service:

- (i) shall not cause harmful interference to stations of primary services to which frequencies are already assigned or to which frequencies may be assigned at a later date;
- (ii) cannot claim protection from harmful interference from stations of a primary service to which frequencies are already assigned or may be assigned at a later date;
- (iii) can claim protection, however, from harmful interference from stations of the same or other secondary service(s) to which frequencies may be assigned at a later date.

¹ For the specifications for the different classes of amateur radio licence refer to Framework for Amateur Radio Operations in Saint Lucia.

Wavelength/Band	Frequency Band (MHz)	Max. TX Power (W)	Modes of Operation	Comment
160 m	1.800 - 2.000	1200	CW, Data, SSB	Primary Service
75/80 m	3.500 - 3.725	1200	CW, Data	Primary Service
75/80 m	3.775 - 4.000	1200	SSB	Primary Service
60 m	Channels centred on 5332, 5348, 5368, 5373 and 5405	50 (ERP)	SSB	Not recognized by ECTEL
40 m	7.000-7.150	800	CW, Data	Primary Service
40 m	7.150 - 7.300	1200	SSB	Primary Service
30 m	10.100-10.150	1200	CW, Data	Secondary Service
20 m	14.000-14.150	1200	CW,Data	Primary Service
20 m	14.150-14.350	1200	SSB	Primary Service
17m	18.068-18.110	800	CW,Data	Primary Service
17m	18.110- 18.168	800	SSB	Primary Service
15m	21.000-21.200	1200	CW, Data	Primary Service
15m	21.200-21.450	1200	SSB	Primary Service
12 m	24.890-24.930	800	CW, Data	Primary Service
12 m	24.930-24.990	800	SSB	Primary Service
10 m	28.000-28.300	800	CW, Data	Primary Service
10 m	28.300-29.500	800	SSB	Primary Service
10 m	29.500-29.700	100	FM, Repeater Operation	Primary Service
6 m	50.000-50.100	500	CW, Data	Primary Service
6 m	50.100-51.100	500	SSB	Primary Service
6 m	51.100-54.000	100	FM, Repeater Operations	Primary Service
2 m	144.000-144.100	200	CW, Data	Primary Service
2 m	144.100-144.300	200	SSB	Primary Service
2 m	144.300-144.500	200	Satellite	Primary Service
2 m	145.800-146.000	200	Satellite	Primary Service
2 m	146.000-147.995	100	FM, Repeater Operations	Primary Service
1.25 m	222.340-223.380	100	FM repeater	Primary Service
1.25 m	223.380-224.000	100	FM	Primary Service
70 cm	432.000-432.125	150	CW, Data	Secondary Service
70 cm	432.125-438.000	100	FM,SSB	Primary Service
70 cm	442.000-450.000	100	FM, Repeater Operation	Not Recognized by ECTEL
33 cm	902-906	1.0	CW, Data	Secondary Service
33 cm	906-910	1.0	FM, Repeater Operations	Secondary Service
33 cm	910-916	1.0	FSTV	Secondary Service
33 cm	916-918	1.0	Data	Secondary Service
33 cm	918-919	1.0	FM	Secondary Service
33 cm	919-928	1.0	FM, Repeater Operations, FSTV	Secondary Service
23 cm	1240-1252	5.0	Digital TV	Secondary Service
23 cm	1252-1258	5.0	FSTV	Secondary Service
23 cm	1258-1260	5.0	Data	Secondary Service
23 cm	1260-1270	5.0	Satellite, FSTV	Secondary Service
23 cm	1270-1295	5.0	FM, Repeater	Secondary Service

			Operations, FSTV	
23 cm	1295-1300	5.0	CW, Data	Secondary Service
-	2300-2450	1.0	Data, FM, SSB, FSTV, Satellite	Secondary Service
-	3400-3500	1.0	Beacons	Secondary Service
-	5850-6700	1.0	Beacons	Secondary Service
-	(10.0 -10.5)GHz	1.0	Beacons	Secondary Service
-	(24.0 - 24.25) GHz	1.0	All modes	Primary Service
-	(47.0 - 47.2)GHz	1.0	All modes	Primary Service
-	(76.0 - 81.0)GHz	1.0	All modes	Secondary Service
-	(122.25 - 123.0) GHz	1.0	All modes	Secondary Service
-	(134.0 - 136.0) GHz	1.0	All modes	Primary Service
-	(136.0 - 141.0) GHz	1.0	All modes	Secondary Service
-	(241.0 - 248.0) GHz	1.0	All modes	Secondary Service
-	(248.0 - 250.0) GHz	1.0	All modes	Primary Service

Table 6.1: The Frequency Bands, Maximum Transmission Power and Modes of Operation for Amateur Radio Service.

6.2 EMISSION CLASS

6.2.1 Table 6.2 provides some examples of commonly used amateur transmissions and the corresponding emission classes.

Modes of Operation	Emission mode symbols for a particular transmitter Modulation			
	AM	SSB	FM	PM
Morse	A1A	J2A	F1B	G1B
	A1B	J2B		
Speech	A3E	J3E	F3E	G3E
Data	A2D	J2D	F1D	G1D
	A1D		F2D	G2D
RTTY	A2D	J2D	F2D	G2D
Facsimile	A2C	J2C	F2C	G2F
FSTV	C3F	J3F	F3F	G3F
	A3F			
SSTV	A2F	J2F	F2F	G2F
		J3F	F3F	G3F

Table 6.2: Some Examples of Emission Class of Amateur Radio Service.

6.3 BANDWIDTH

6.3.1 Table 6.3 presents the maximum bandwidths for the different frequency bands within the amateur radio service.

Frequency Bands	Maximum Bandwidth (kHz)
160 Metres	
1.800-2.000 MHz	3
75/80 Metres	
3.500-3.580 MHz	0.200
3.580-3.620 MHz	0.500
3.620-3.635 MHz	3
3.635-4.000 MHz	3
40 Metres	
7.000-7.035 MHz	0.200
7.035-7.100 MHz	0.500
7.100-7.105 MHz	3
7.105-7.300 MHz	3
30 Metres	
10.100-10.120 MHz	0.200
10.120-10.135 MHz	0.500
10.135-10.140 MHz	3
10.140-10.150 MHz	3
20 Metres	
14.000-14.065 MHz	0.200
14.065-14.100 MHz	0.500
14.100-14.112 MHz	3
14.112-14.350 MHz	3
17 Metres	
18.068-18.100 MHz	0.200
18.100-18.110 MHz	0.500
18.110-18.168 MHz	3
15 Meteres	
21.000-21.080 MHz	0.200
21.080-21.150 MHz	0.500
21.150-21.160 MHz	3
21.160-21.450 MHz	3

12 Metres	
24.890-24.920 MHz	0.200
24.920-24.930 MHz	0.500
24.930-24.990 MHz	3
10 Metres	
28.000-28.050 MHz	0.200
28.050-28.120 MHz	0.500
28.120-28.189 MHz	3
28.189-29.000 MHz	3
29.000-29.700 MHz	16
6 Metres	
50.000-50.100 MHz	100
50.100-51.100 MHz	100
51.100-54.000 MHz	100
2 Metres	
144.000-144.100 MHz	100
144.100-144.300 MHz	100
144.300-144.500 MHz	100
145.800-146.000 MHz	100
146.000-147.995 MHz	100
1.25 Metres	
222.340-223.380 MHz	100
223.380-224.000 MHz	100

Table 6.3: The maximum transmission bandwidth for the different Amateur Radio Frequency Bands.

6.3.2 The bands 70 cm and onwards: Bandwidths of 100 kHz are permitted for data, whilst vestigial sideband AM is permitted bandwidths of up to 6 MHz.

6.4 SPURIOUS EMISSION LIMITS

6.4.1 The maximum permitted spurious emission level is calculated by subtracting the following attenuation values from the transmitting power supplied to the antenna transmission line.

For amateur service operating below 30 MHz (including SSB):
 $43 + 10 \log (\text{PEP})$ or 50 dB, select the value which is less stringent.

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

For all other amateur service above 30 MHz:
 $43 + \log (P)$ or 70 dBc, select the value which is less stringent.

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

dBc: decibels relative to the unmodulated carrier power of the emission. In the cases which do not have a carrier, for example in some digital modulation schemes where the carrier is not accessible for measurement, the reference level equivalent to dBc is decibels relative to the mean power P .

6.5 FREQUENCY TOLERANCE

- 6.5.1 The carrier frequency tolerance shall be better than ± 5 ppm for a temperature range of -10°C to 50°C .

7.0 TECHNICAL REQUIREMENTS OF RECEIVERS

7.1 SPURIOUS RESPONSE REJECTION

- 7.1.1 At any frequency separated from the nominal frequency of the receiver by more than two channels, the spurious response rejection ratio shall be not less than 70 dB.

7.2 RECEIVER SENSITIVITY

- 7.2.1 The sensitivity of the receiver is the level of the signal at the nominal frequency of the receiver which, when applied to the receiver input produces:
- (i) in all cases, an audio frequency output power not less than 50 % of the rated output power; and
 - (ii) a SINAD ratio of 12 dB.

The maximum sensitivity shall not exceed -101 dBm under normal operations.

8.0 ANTENNAS AND AERONAUTICAL OBSTRUCTION CLEARANCE.

- 8.1 Antennas installed at a fixed locations (whether receiving, transmitting or both), must comply with either one of the following:
- (i). The highest point must not be more than 6.10 meters (20 feet) higher than the highest point of the building or tree on which it is mounted; or
 - (ii) The highest point must not be more than 18.3 meters (60 feet) above the ground.

- 8.2 If an amateur station is located near an airport, and if the antenna structure is more than 6.1 meters (20 feet) high, the operator may have to obey additional restrictions. The highest point of an antenna must not exceed one meter above the airport elevation for every hundred meters of distance from the nearest point of the nearest airport runway. Differences in ground elevation between the antenna and the airport runway may complicate this formula.
- 8.3 Installation and removal of amateur station antennas near electric power lines is dangerous. For safety, follow the necessary safety instructions with installing an antenna.

ANNEX A

CLASSIFICATION OF EMISSION

Emissions shall be classified and symbolized according to their basic characteristics as given in Part I and any optional additional characteristics as provided for in Part II.

The basic characteristics (see Part I) are:

- 1) first symbol – type of modulation of the main carrier;
- 2) second symbol – nature of signal(s) modulating the main carrier;
- 3) third symbol – type of information to be transmitted.

Modulation used only for short periods and for incidental purposes (such as, in many cases, for identification or calling) may be ignored provided that the necessary bandwidth as indicated is not thereby increased.

PART I – BASIC CHARACTERISTICS

1) *First symbol* – Type of modulation of the main carrier

- | | |
|--|---|
| 1.1) Emission of an unmodulated carrier | N |
| 1.2) Emission in which the main carrier is amplitude-modulated (including cases where sub-carriers are angle-modulated) | |
| 1.2.1) Double-sideband | A |
| 1.2.2) Single-sideband, full carrier | H |
| 1.2.3) Single-sideband, reduced or variable level carrier | R |
| 1.2.4) Single-sideband, suppressed carrier | J |
| 1.2.5) Independent sidebands | B |
| 1.2.6) Vestigial sideband | C |
| 1.3) Emission in which the main carrier is angle-modulated | |
| 1.3.1) Frequency modulation | F |
| 1.3.2) Phase modulation | G |
| 1.4) Emission in which the main carrier is amplitude- and angle-modulated either simultaneously or in a pre-established sequence | D |

1.5) Emission of pulses ⁱ	
1.5.1) Sequence of unmodulated pulses	P
1.5.2) A sequence of pulses	
1.5.2.1) modulated in amplitude	K
1.5.2.2) modulated in width/duration	L
1.5.2.3) modulated in position/phase	M
1.5.2.4) in which the carrier is angle-modulated during the angle-period of the pulse	Q
1.5.2.5) which is a combination of the foregoing or is produced by other means	V
1.6) 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	W
1.7) Cases not otherwise covered	X
2) <i>Second symbol</i> – Nature of signal(s) modulating the main carrier	
2.1) No modulating signal	0
2.2) A single channel containing quantized or digital information without the use of a modulating sub-carrier ⁱⁱ	1
2.3) A single channel containing quantized or digital information with the use of a modulating sub-carrier ⁱⁱ	2
2.4) A single channel containing analogue information	3
2.5) Two or more channels containing quantized or digital information	7
2.6) Two or more channels containing analogue information	8
2.7) Composite system with one or more channels containing quantized or digital information, together with one or more channels containing analogue information	9
2.8) Cases not otherwise covered	X

ⁱ Emissions where the main carrier is directly modulated by a signal which has been coded into quantized form (e.g. pulse code modulation) should be designated under § 1.2 or 1.3.

ⁱⁱ This excludes time-division multiplex.

3) *Third symbol* – Type of information to be transmittedⁱⁱⁱ

- | | |
|--|---|
| 3.1) No information transmitted | N |
| 3.2) Telegraphy – for aural reception | A |
| 3.3) Telegraphy – for automatic reception | B |
| 3.4) Facsimile | C |
| 3.5) Data transmission, telemetry, telecommand | D |
| 3.6) Telephony (including sound broadcasting) | E |
| 3.7) Television (video) | F |
| 3.8) Combination of the above | W |
| 3.9) Cases not otherwise covered | X |

PART II: OPTIONAL CHARACTERISTICS FOR CLASSIFICATION OF EMISSIONS

These are:

Fourth symbol – Details of signal(s)

Fifth symbol – Nature of multiplexing

Where the fourth or fifth symbol is used it shall be as indicated below.

Where the fourth or the fifth symbol is not used this should be indicated by a dash where each symbol would otherwise appear.

1) *Fourth symbol* – Details of signal(s)

- | | |
|---|---|
| 1.1) Two-condition code with elements of differing numbers and/or durations | A |
| 1.2) Two-condition code with elements of the same number and duration without error-correction | B |
| 1.3) Two-condition code with elements of the same number and duration with error correction | C |
| 1.4) Four-condition code in which each condition represents a signal element (or one or more bits) | D |
| 1.5) Multi-condition code in which each condition represents a signal element (of one or more bits) | E |
| 1.6) Multi-condition code in which each condition or combination of conditions represents a character | F |
| 1.7) Sound of broadcasting quality (monophonic) | G |
| 1.8) Sound of broadcasting quality (stereophonic or quadrasonic) | H |

ⁱⁱⁱ In this context the word “information” does not include information of a constant, unvarying nature such as is provided by standard frequency emissions, continuous wave and pulse radars, etc.

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1.9) Sound of commercial quality (excluding categories given in 1.10) and 1.11)	J
1.10) Sound of commercial quality with the use of frequency inversion or band splitting	K
1.11) Sound of commercial quality with separate frequency-modulated signals to control the level of demodulated signal	L
1.12) Monochrome	M
1.13) Colour	N
1.14) Combination of the above	W
1.15) Cases not otherwise covered	X
2) <i>Fifth symbol</i> – Nature of multiplexing	
2.1) None	N
2.2) Code-division multiplex ^{iv} .	C
2.3) Frequency-division multiplex	F
2.4) Time-division multiplex	T
2.5) Combination of frequency-division multiplex and time-division multiplex	W
2.6) Other types of multiplexing	X

^{iv} : This includes bandwidth expansion techniques.