

## **Class Licence for Citizens Band Radio Station**

### **Analysis of Comments Received, Preliminary Conclusions and Further Consultation**

**16 December 2005**

#### **Introduction**

On 23 May 2005, the Office of the Telecommunications Authority (“OFTA”) issued a consultation paper entitled “Consultation Paper on the Creation of a Class Licence for Citizens Band Radio Station under section 7B(2) of the Telecommunications Ordinance” (the “First Consultation Paper”). In the First Consultation Paper, the Telecommunications Authority (“TA”) proposed to allow the general public to use portable and mobile Citizens Band radios (“CB radios”) in the 26.96 – 27.41 MHz band by creating a class licence which will be called “Class Licence for Citizens Band Radio Station” (the “Class Licence”). Under the class licensing scheme, no individual licence application is required for the possession or use of portable and mobile CB radios in compliance with the conditions of the Class Licence. This ensures users will enjoy the use of CB radios without unnecessary licensing burden.

2. By the deadline of the consultation period on 23 June 2005, the TA received a total of eight submissions (including one late submission):

- ERICWU
- Hong Kong Amateur Radio Transmitting Society (“HARTS”)
- Hong Kong Cable TV Limited (“HKCTV”)
- Hong Kong Police Force (“HKPF”)
- Mixer Truck Drivers Association (“MTDA”)
- QSQUAD857
- SSW409
- WLHO

The submissions can be downloaded from OFTA's website at <http://www.ofta.gov.hk/en/report-paper-guide/paper/consultation/20050708/table.html>.

3. After considering the comments received, the TA sets out in this consultation paper his views on these comments and his preliminary conclusions on the subject matter. The TA would like to seek further views and comments from the public before he takes a decision on the matter.

### **Allowing the Use of CB Radio under the Class Licence**

4. Of the eight submissions received, five submissions (ERICWU, HARTS, QSQUAD857, SSW409 and WLHO) generally supported the policy of allowing the general public to use CB radios under the Class Licence. Two submissions (HKCTV and MTDA) were concerned about the radio interference which might be caused by the use of CB radios and did not support TA's proposal. HKPF only commented on the proposed use of Channel 9 as emergency channel.

5. ERICWU opined that CB channels might be occupied by commercial users as in the case of 409 MHz short-range portable radios. The TA wishes to point out that one of the purposes of allowing the use of CB radios is to facilitate commercial users to have low-cost radio communications means without the burden of obtaining a licence. As a matter of fact, it is not uncommon to deploy CB radios for commercial use in other parts of the world. To encourage efficient use of radio spectrum, the TA does not find it justifiable to restrict the use of CB radios to non-commercial use only.

6. HARTS pointed out that there had been uses and sales of CB equipment with 40 or more channels, five-watt or even higher transmitting power in Hong Kong for decades. They opined that enforcement actions had not been effective to stop the possession and use of unlicensed CB (and other) two-way radios in Hong Kong. However, as seen from the popularity of 409 MHz short-range portable radios, there was a strong demand in the community for short-range radio

communication devices. HARTS therefore supported the TA's policy of allowing the general public to use CB radios under the Class Licence and shared the TA's view that allowing public use of CB radios under Class Licence, together with labelling requirement and restricting the sales of non-type-approved CB radios would, to a certain extent, address the use of illegal radio equipment.

7. In response to HARTS' comments, the TA wishes to point out that the sale of CB equipment in Hong Kong by authorised radio dealers to visitors for export purpose is permitted under the current licensing regime in Hong Kong. As regards the illegal use of CB radios, the TA considers the illegal use of CB radios has not been popular in recent years as can be seen from OFTA's statistics on equipment forfeited<sup>1</sup>.

8. SSW409 stated that allowing public use of CB radios in Hong Kong was in line with the international practice. He suggested the TA to consider releasing other popular frequency bands, for instance, the 462 and 467 MHz bands, (also known as Family Radio Services ("FRS") band in the US), for short-range portable radio communications.

9. OFTA has considered the possibility of releasing the FRS 462 and FRS 467 MHz frequency bands at the Radio Spectrum Advisory Committee ("RSAC") meeting held on 15 April 2002. However, the FRS bands are presently assigned to government users and other licensed services in Hong Kong. Under this circumstance, these frequency bands cannot be released for FRS radios. However, the TA would like to re-iterate that it is the government's policy to promote efficient use of radio spectrum and one way to achieve this objective is to allocate radio spectrum which access is open to all users. OFTA will continue to pursue this objective and make available more frequency bands for open access.

10. WLHO welcomed the TA's initiative of allowing the public use of CB radios in Hong Kong which would demonstrate Hong Kong as an advanced and prosperous city. QSQUAD857 considered that allowing

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<sup>1</sup> OFTA's enforcement statistics are published on OFTA's website and can be accessed from the link <http://www.ofa.gov.hk/en/datastat/prosec-cases.html>.

public use of CB radios would allow the general public to enjoy wireless communications and provide additional communications channels for summoning emergency assistance on land and at sea.

11. MTDA was concerned about the radio interference that might be caused by CB radios operating outside the prescribed band, in particular, the mobile CB radios. The TA would like to stress that the Class Licence will only allow the public to use CB radios which are type-approved by OFTA. These radios shall meet prescribed specifications set by the TA. To this end, the TA will amend the Radio Dealer Licence to restrict the sales of non-type-approved CB radios in Hong Kong. With the stepping up of these regulatory measures, the TA believes that the chance of CB radios operating outside the prescribed band causing interference to other licensed radio communications services would be minimal. As regards MTDA's request for a dedicated channel for their trade, the TA would like to advise that the operation of CB radios under the Class Licence will be on an uncoordinated and unprotected basis. It is not feasible to assign a dedicated CB channel for use by any particular trade. However, MTDA may consider encouraging their members to use a particular channel for communications among their members.

12. HKCTV did not support the TA to allow the public use of CB radios in the 26.96 – 27.41 MHz frequency band. HKCTV expressed grave concern that operating CB radios in the 26.96 – 27.41 MHz frequency band might cause interference to the in-building coaxial cable distribution system (“IBCCDS”) frequency channels operating in the 21 – 33.8 MHz for upstream transmission, which are being used by HKCTV for the provision of broadband Internet services. HKCTV considered that the TA should not assign any frequency bands for CB radios which might overlap with the IBCCDS frequency channels already assigned to a fixed network operator. HKCTV further requested the TA to postpone the issue of the Class Licence until the actual tests on potential radio interference caused by CB radios to IBCCDS frequency channels are completed.

13. In response to HKCTV's comments, OFTA has conducted joint tests with HKCTV from 21 September 2005 to 18 October 2005.

Noting that IBCCDS are installed inside buildings, OFTA has conducted tests to assess the interference that might be caused by indoor and outdoor operation of CB radios to the IBCCDS frequency channels. The tests results have revealed that there will be no adverse effect to the normal operation of HKCTV's broadband services for the operation of CB radios outside the buildings. On the other hand, CB transmissions inside the building and in close proximity to the IBCCDS may cause degradation in the bit error rate of the IBCCDS frequency channels.

14. The TA notes that the respondents generally support the TA's proposal of allowing the public to use CB radios under Class Licence. The TA also acknowledges those contrary views which are mainly concerned with the potential radio interference that might be caused by the operation of CB radios, in particular, to the IBCCDS frequency channels. However, the TA notes that CB radios would only cause radio interference to IBCCDS channels when the CB radios are transmitting in close proximity to the IBCCDS. Since all the IBCCDS are installed inside buildings, it would therefore be feasible to minimise the chance of radio interference to IBCCDS if CB transmissions are not allowed indoors. Having considered the benefits that would be brought to the community and the fact that radio interference to IBCCDS can be avoided by restricting the transmission of CB radios at outdoor only, **the TA is prepared to allow the public use of portable and mobile CB radios under the Class Licence, subject to the restriction that indoor use of CB radios to transmit radio signals is not permitted. For indoor use of CB radios, only receiving mode is permitted.** The TA will include such restriction as a licence condition in the Class Licence.

### **CB Radios Installed at Fixed Locations**

15. HARTS welcomed the TA to consider licensing the operation of CB radios installed at fixed locations. It pointed out that some fixed CB installations might be necessary if Channel 9 was to be effectively used for emergency communications. On the other hand, SSW409 suggested that a separate "Personal Repeater Licence" for those who might have the communication needs with CB at fixed locations.

16. In the First Consultation Paper, the TA has expressly indicated that CB radios installed at fixed locations will not be permitted under the Class Licence. The reasons for imposing such a restriction is to avoid the proliferation of CB antennas on rooftops which might cause public concern on radiation hazards and to avoid interference to FM and TV reception if CB antennas are spaced too close to communal antennas.

17. Having considered the comments received, **the TA maintains his view that CB radios installed at fixed locations should not be permitted under the Class Licence.** However, the TA may license CB radios installed at fixed locations on a case by case basis. These installations will be subject to licensing control and requirements including size and position of the antennas, non-ionization radiation levels, applicants' evidence proof of their rights to access the rooftops and common parts of the buildings for antenna installations.

### **Type-approval and Labelling**

18. HARTS strongly supported that only type-approved CB radios under OFTA's Compulsory Certification Scheme should be allowed. They further opined that all CB radios sold in Hong Kong should have a certification label affixed to them in order to avoid any confusion to the consumers. On the other hand, QSQUAD857 requested the TA to consider permitting the use of home-made CB radios for the purpose of promoting the interest of electronics hobbyists.

19. The TA considers that equipment type-approval requirement is a necessary arrangement to control the potential radio interference caused by CB radios and hence the successful implementation of the Class Licence scheme for CB radios. The type-approval requirement ensures that the CB radios will comply with the technical specifications of OFTA thus avoiding the possibility of radio interference caused by the use of sub-standard CB radios. As regards the request for allowing the use of home-made CB radios, since the Class Licence will not permit the indoor transmission of the CB radios, any indoor tests or experiments related to transmission of CB radios including home-made CB radios will not be permitted under the Class Licence.

20. The TA notes that the requirement for equipment type-approval and labelling for CB radios receives support from the respondents. **The TA re-affirms his view given in the First Consultation Paper that CB radios for use in Hong Kong shall be type-approved under the Compulsory Certification Scheme.**

21. In the First Consultation Paper, the TA has mentioned that CB radios with a certification label can help the public to distinguish the conformity of the equipment to the specifications prescribed by OFTA. Having considered the comments received, the TA is prepared to implement a voluntary labelling requirement for CB radios. Although currently voluntary equipment labelling does not apply to equipment type-approved under the Compulsory Certification Scheme, the TA will amend the labelling scheme to provide flexibility of issuing certification labels to all equipment classified under Voluntary Certification Scheme and Compulsory Certification Scheme including CB radios. In order to increase the public awareness to the type-approval requirement of CB radios, the TA will launch publicity programmes to educate the general public to only buy and use type-approved CB radios.

### **Channel 9 for Emergency Communications**

22. In the First Consultation Paper, the TA has proposed Channel 9 for emergency use as this is a well-established practice in other countries where CB has been allowed for public use. WLHO and HKPF were concerned about the limited operating distance under the point-to-point mode of operation. WLHO proposed that some field trials should be conducted to verify the effectiveness of CB radios as a supplementary means to summon emergency assistance. SSW409 suggested OFTA to list out the official bodies that will monitor Channel 9 and their monitoring hours.

23. The TA recommends that Channel 9 should be used as the channel for emergency communications<sup>2</sup>. Moreover, in most countries

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<sup>2</sup> The TA has also encouraged the use of Channel 9 of 409 MHz walkie talkies for emergency communications only. Please see the relevant information published on OFTA's website ([http://www.ofa.gov.hk/en/ca\\_bd/Coverage-in-country-park-main.html](http://www.ofa.gov.hk/en/ca_bd/Coverage-in-country-park-main.html)).

including the United Kingdom and Australia, while Channel 9 of the CB radios is recommended by the regulators for emergency use, the channel is monitored by the non-governmental organisations on a voluntary basis. The approach in Hong Kong should be similar.

24. The TA will therefore raise public awareness through public education. OFTA will publish leaflets for distribution to the public, aiming at enhancing the public awareness on the use of Channel 9 and that Channel 9 should not be used unless it is really an emergency. OFTA will continue to work with organizations such as amateur radio societies and hikers associations. CB users will be encouraged to buy CB radios with “dual-watch” function which allows users to be alerted of a call at Channel 9 even though the users have pre-set their CB radios to other channels for normal communications. CB users will also be educated to pay immediate attention to any Channel 9 distress calls so that assistance could be offered to the caller.

### **Specifications of CB Radios**

25. In the First Consultation Paper, the TA has attached a draft Class Licence. In the Schedule of the draft Class Licence, the TA has proposed the maximum transmitted power levels of various transmission modes, the frequencies and the channel width of the CB radios. The TA has not received any comments on the proposed technical parameters for CB radios. However, the TA has reviewed the specifications of overseas standard setting organisations in the US and Europe and the specifications of commonly available single-sideband CB radios in the market worldwide and noticed that the maximum power levels of single-sideband CB radios are mostly set at 12 watts (peak envelope power). Having regard to this finding, **the TA is mindful to set the maximum power level for single-sideband modulation at sea to 12 watts (peak envelope power).**

26. In the First Consultation Paper, the TA has not specified the modulation types permitted under the Class Licence. **The TA has now proposed in the Class Licence in Appendix 1 that Double-Sideband Amplitude Modulation, Single-Sideband Amplitude Modulation, Phase Modulation and Frequency Modulation be permitted under the Class Licence.** To prevent communications difficulties caused by

use of different modulation types, in the public education referred to in paragraph 24, the TA will encourage the use of Double-Sideband Amplitude Modulation for emergency communications in Channel 9.

### **Sale of Non-type-approved CB Radios Not Allowed**

27. As mentioned in paragraph 20, the TA will only allow the public to use CB radios which are type-approved by OFTA. In paragraph 19 of First Consultation Paper, the TA has proposed that the Radio Dealers Licence will be amended to restrict the radio dealers for sale of non-type-approved CB radios. The TA has not received any comments on his proposal. As some radio dealers may still maintain some stocks of CB radios which do not comply with the prescribed specifications, they will be given three months grace period, from the publication of the finalised Class Licence, to dispose of the stocks. After the grace period, the TA will include the amended condition in the Radio Dealer Licence during the annual licence renewal to restrict the sales of non-type-approved CB radios in Hong Kong. The TA has today issued circular letters to all radio dealers drawing their attention to this second consultation paper and the proposals in this paragraph.

### **Commencement of the Class Licence**

28. The Class Licence in Appendix 1 of this consultation paper is the revised version incorporating the changes mentioned above and other minor textual revisions. The technical specifications of the CB radios are set out in HKTA 1022 (Issue 3) which has been published by OFTA in February 2003 and a newly developed draft HKTA 1050. The English versions of both specifications are attached at Appendix 2 of this consultation paper. The Class Licence will be issued by the TA under sections 7(5) and 7B(2) of the Telecommunications Ordinance (Cap. 106). After considering the responses to this consultation paper, the TA will publish the finalised Class Licence and announce the effective date of commencement in the Gazette.

## **Invitation for Further Comments**

29. This consultation paper sets out the TA's views and proposals after due consideration of the submissions received in response to the First Consultation Paper. Before he takes the decision on this matter, the TA would like to seek views from the industry and any interested party on the various issues discussed in this consultation paper. The TA has today published in the Gazette a notice under section 7B(3) of the Telecommunications Ordinance inviting representations from members of the public on the proposed creation of the Class Licence. Views and comments should reach OFTA on or before 6 January, 2006.

30. It follows that by this consultation paper, the TA should not be taken to have formed any views, opinions or decisions for the issues which are still subject to consultation. For the avoidance of doubt, this consultation paper is not purporting to exercise any of his powers under any of the provisions of the Telecommunications Ordinance or licences in relation to any person directly or indirectly identified in this consultation paper.

31. The TA reserves the right to publish all views and comments and to disclose the identity of the source. Any part of the submission, which is considered commercially confidential, should be clearly marked. The TA would take such markings into account in making his decision as to whether to disclose such information or not. Submissions should be addressed to:

Office of the Telecommunications Authority  
29/F, Wu Chung House  
213 Queen's Road East  
Wan Chai  
Hong Kong  
Attention: Senior Telecommunications Engineer  
(Spectrum Planning)  
Fax: 2803 5112  
Email: [cb@ofta.gov.hk](mailto:cb@ofta.gov.hk)

An electronic copy of the submission should be provided by email to the address indicated above.

**Office of the Telecommunications Authority**  
**16 December 2005**

**TELECOMMUNICATIONS ORDINANCE  
(Chapter 106)**

**CLASS LICENCE**

**CITIZENS BAND RADIO STATION**

The Telecommunications Authority, in exercise of the powers conferred on him by sections 7(5) and 7B(2) of the Telecommunications Ordinance (Chapter 106), issues this Licence on this [] day of [ ], 200[ ].

**1. Interpretation**

1.1 In this Licence –

“Authority” means the Telecommunications Authority appointed under section 5 of the Ordinance;

“Citizens Band radio station” or “CB station” means a radio station falling within the description of the Schedule to this Licence;

“Licensee” means a person licensed under Condition 2 of this Licence;

“Ordinance” means Telecommunications Ordinance (Chapter 106); and

“Telecommunication Convention” means any Constitution and Convention of the International Telecommunication Union and the Radio Regulations annexed thereto, which have from time to time or at any time been acceded to by or applied to Hong Kong.

1.2 Any word or expression used in this Licence shall, unless otherwise provided, have the same meaning as it has in the Ordinance or regulations made under the Ordinance.

1.3 For the purposes of interpreting this Licence, headings and titles shall be disregarded.

## **2. Grant of Licence**

2.1 Subject to the terms and conditions of this Licence, a person is licensed to maintain, possess and use the CB station described in the Schedule.

## **3. General**

3.1 This Licence shall not be construed as granting an exclusive right to the Licensee.

3.2 This Licence replaces any licence or any exemption from licensing, however described, which the Authority may have granted to the Licensee.

3.3 This Licence shall remain in full force unless expressly revoked by the Authority.

## **4. Compliance Generally**

4.1 The Licensee shall comply with the Ordinance, regulations made under the Ordinance, licence conditions or any other instruments which may be issued by the Authority under the Ordinance and such guidelines or Codes of Practices which may be issued by the Authority as in his opinion are suitable for the purpose of providing practical guidance on any particular aspect of any conditions of the Licence.

- 4.2 The Licensee shall observe and comply with the relevant provisions of the Telecommunication Convention.
- 4.3 The Licensee shall not use the CB station to provide a public telecommunications service.
- 4.4 The Licensee is restricted to use the CB station for voice communications only.
- 4.5 The Licensee shall not use the CB station at indoor locations to transmit any radio signals. For the avoidance of doubt, indoor use of the CB station for reception of radio signals is permitted.

## **5. Interference**

- 5.1 The Licensee shall take reasonable measures to operate, maintain and use the CB station in such a way as not to cause any direct or indirect harmful interference with any lawful telecommunications service or any telecommunications apparatus licensed or authorized under the Ordinance.
- 5.2 The CB station shall be made available for inspection and testing, if so required, by any person authorised for the purpose by the Authority.
- 5.3 The Authority may give such reasonable directions as he thinks fit to avoid any direct or indirect harmful interference referred to in Condition 5.1. The Licensee shall comply with the directions.
- 5.4 The Licensee should be aware that the frequencies allocated to the CB station are shared with other applications in an uncoordinated manner and therefore not protected from harmful interference caused by other telecommunications installations or radio equipment operating in accordance with the provisions of the Ordinance, or regulations or orders made under the Ordinance.

## **6. Type Approval**

- 6.1 The Licensee shall only use CB stations which have been type-approved by the Office of the Telecommunications Authority.

## **7. Restriction Against use of Station at a Fixed Location**

- 7.1 The use of CB station installed at a fixed location in Hong Kong is strictly prohibited under this Class Licence. The Licensee shall not use the CB station to connect with an indoor or outdoor antenna for use as a CB station at a fixed location.

## **8. Emergency Communications**

- 8.1 Channel 9 should be used for purposes of emergency communications as far as possible. For the avoidance of doubt, the Licensee may use any Channel for emergency communications purpose.

## **9. Technical Criteria**

- 9.1 The CB station shall at all times comply with the technical criteria specified in the Schedule.

## SCHEDULE

### Citizens Band Radio Station

Citizens Band radio station or CB station under this Licence refers to a mobile or portable radio station which complies with the technical specification HKTA 1022 or HKTA 1050 issued by the Authority and is type-approved by the Authority pursuant to sections 32D and 32E of the Telecommunications Ordinance and conforms to the technical criteria below:

#### Technical Criteria

Frequency band: 26.96 – 27.41 MHz

Frequency channels:

<b>Channel</b>	<b>Centre Frequency (MHz)</b>	<b>Channel</b>	<b>Centre Frequency (MHz)</b>
1	26.965	21	27.215
2	26.975	22	27.225
3	26.985	23	27.255
4	27.005	24	27.235
5	27.015	25	27.245
6	27.025	26	27.265
7	27.035	27	27.275
8	27.055	28	27.285
9	27.065	29	27.295
10	27.075	30	27.305
11	27.085	31	27.315
12	27.105	32	27.325
13	27.115	33	27.335
14	27.125	34	27.345
15	27.135	35	27.355
16	27.155	36	27.365
17	27.165	37	27.375

18	27.175	38	27.385
19	27.185	39	27.395
20	27.205	40	27.405

Channel width: 10 kHz

Modulation: Double-sideband amplitude modulation

Frequency modulation

Phase modulation

Single-sideband amplitude modulation

Power limits:

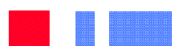
	On Land	At Sea
Modulations other than single-sideband	4 watts carrier power	10 watts carrier power
Single-sideband modulation	12 watts peak envelope power	12 watts peak envelope power

## **Appendix 2**

HKTA 1022  
ISSUE 3  
February 2003

# **PERFORMANCE SPECIFICATION FOR 27MHz CITIZEN BAND (CB) RADIO TRANSCEIVERS FOR USE ON-BOARD FISHING VESSELS**

**OFTA**



電訊管理局

**Telecommunications Authority  
Hong Kong**

## **FOREWORD**

1. This specification is prescribed under section 32D of the Telecommunications Ordinance (Cap 106) (“the Ordinance”) to set out the technical and evaluation requirements for 27 MHz band Citizen Band (CB) radio transceivers for use on-board fishing vessels in Hong Kong. Radiocommunications apparatus falling into the scope of this specification shall meet the stipulated requirements.
2. Under the Ordinance, the possession or use of any radiocommunications apparatus or any apparatus emitting radio frequency energy must be covered by an appropriate licence issued by the Telecommunications Authority (TA) with the exception of those specifically exempted from licensing under the Ordinance, such as those covered by the Telecommunications (Telecommunications Apparatus)(Exemption from Licensing) Order.
3. At present, the Office of the Telecommunications Authority (OFTA) operates a Hong Kong Telecommunications Equipment Evaluation and Certification (HKTEC) Scheme. Details of the HKTEC Scheme can be found in the information note OFTA I 421. Under the Scheme, suppliers or manufacturers of the radiocommunications apparatus shall apply to OFTA for certification of their apparatus against this specification. The application procedures for certification of radiocommunications apparatus can be found in the information note OFTA I 401.
4. The TA reserves the right to give separate certification to models he considers to be technical variants and the performance of which may differ between models.
5. The TA may amend any part of this specification as and when he deems necessary.
6. In case of doubt about the interpretation of this specification, the methods of carrying out the test and the validity of statements made by the equipment manufacturers or suppliers about the equipment, the decision of the TA shall be final.
7. The HKTA specifications and information notes are issued by the TA. The documents can be obtained through one of the following methods —
  - downloading direct through the OFTA's Internet Home Page. The Home Page address is <http://www.ofta.gov.hk>;
  - making a request for hard copies to :-

Radio Laboratory,  
Standards Section,  
Office of the Telecommunications Authority,

29/F Wu Chung House,  
213 Queen's Road East,  
Wanchai,  
Hong Kong.

Fax: +852 2343 5824  
Email: radiolab@ofta.gov.hk

8. Enquiries about this specification may be directed to —

Radio Laboratory, Standards Section,  
Office of the Telecommunications Authority,  
29/F Wu Chung House,  
213 Queen's Road East, Wanchai, Hong Kong.

Fax : +852 2343 5824  
Email: radiolab@ofta.gov.hk

## AMENDMENT HISTORY

Item	Issue No.	Paragraph	Descriptions
1.	Issue 3 February 2003	Foreword	Add information of HKTEC Scheme and other editorial changes.

## CONTENTS

1. General
2. Test Conditions: Atmospheric Conditions and Power Supplies
3. Test Conditions: Electrical
4. Tests
5. Accuracy of Measurements

## FIGURES

Explanation notes for figures 2 and 3

Figure 1 : 3-metre Test Site

Figure 2 : Radiation Measurement (Using Test Antenna)

Figure 3 : Radiation Measurement (Using Substitution Antenna)

Figure 4 : Transmitter Carrier Power Test Arrangement

Figure 5 : Transmitter Spurious Emission Test Arrangement

Figure 6 : Receiver Spurious Emissions at Antenna Terminals

## ANNEX

Annex 1 : Channelling Plan

## 1. GENERAL

### 1.1 Scope of specification

This specification covers the minimum performance requirements for CB radio transceivers for use on-board fishing vessels.

### 1.2 Operating Frequencies

The operating frequencies of the equipment shall conform to the channelling plan specified in Annex 1. The channel spacing is 10 kHz. The equipment shall not be capable of operating at frequencies other than those specified in Annex 1.

### 1.3 Modulation

Any one of the following modulation methods will be acceptable :-

1. Frequency modulation
2. Phase modulation
3. Double sideband amplitude modulation
4. Single sideband amplitude modulation

### 1.4 Application

Only equipment designed for fixed installation on a vessel will be accepted. Portable equipment will not be accepted.

### 1.5 Transmitter output power

The output power of transmitter operating in the mode of frequency modulation, phase modulation or double sideband amplitude modulation shall be the measure of carrier power of the transmitter. The rated output power shall be the carrier power declared by the manufacturer and is limited to 10 watts.

The output power of transmitter operating in the mode of single sideband amplitude modulation shall be the measure of the peak envelope power delivered to an artificial load. The rated output power shall be the peak envelope power declared by the manufacturer and is limited to 12 watts.

### 1.6 Spurious emission of transmitter

The power of any spurious emission whether measured as output power level at the antenna terminals or effective radiated power in free space in the specified range of frequencies at either plane of polarization, shall not exceed 4 microwatts for amplitude modulation and 0.25 microwatt for frequency modulation and phase modulation.

## 1.7 Spurious emission of receiver

The power of any spurious emission whether measured as output power level at the antenna terminals or effective radiated power in free space shall not exceed 4 microwatts for amplitude modulation and 20 nanowatts for frequency modulation and phase modulation.

## 2. TEST CONDITIONS: ATMOSPHERIC CONDITIONS AND POWER SUPPLIES

### 2.1 General

Type approval tests shall be made under normal test conditions.

### 2.2 Normal Test Conditions

#### 2.2.1 Normal temperature and humidity

The normal temperature and humidity conditions for tests shall be any convenient combination of temperature, humidity and air pressure within the following ranges :

Temperature	:	15 to 35 degrees Celsius
Relative humidity	:	10 to 80 percent
Air pressure	:	860 to 1060 hPa

When it is impracticable to carry out the tests under the conditions stated above, a note to this effect, stating the actual temperature and relative humidity during the tests, shall be added to the test report.

#### 2.2.2 Mains voltage

For equipment powered by AC mains, 220V  $\pm$  6% at frequency of 50 Hz  $\pm$  1 Hz shall be designated as the normal test voltage.

#### 2.2.3 DC test source voltage

For equipment supplied from self-contained primary cells or batteries or any dc source, the normal test source voltage shall be the nominal supply voltage declared by the manufacturer.

### 3. TEST CONDITIONS: ELECTRICAL

#### 3.1 Normal Test Modulation

3.1.1 For frequency or phase modulation, the normal test modulation shall be a sinusoidal signal of frequency  $1 \text{ kHz} \pm 1\%$  with harmonic distortion not more than 1% and the level adjusted to produce 60% of the maximum permissible frequency deviation.

3.1.2 For double sideband amplitude modulation, the normal test modulation shall be a sinusoidal signal of frequency 1 kHz and the level adjusted to produce a modulation depth of 60%.

3.1.3 For single sideband amplitude modulation, the modulating signal shall comprise two non-harmonically related sinusoidal tones, in the frequency range of 300 Hz to 3000 Hz inclusive, at a level required to establish the rated peak envelope power.

#### 3.2 Transmitter Loading Conditions

The transmitter antenna output shall be terminated with a non-reactive, non-radiating load with nominal impedance of 50 ohms. In case the nominal impedance is of value other than 50 ohms, the manufacturer shall provide suitable matching devices for type-testing purpose.

#### 3.3 General Requirements for Tests Involving the Use of Radiated Field

##### 3.3.1 Test Site

1. The test site shall be flat and free of reflecting objects. No extraneous metal objects having any dimension in excess of 50 mm shall be in the immediate vicinity of the test sample or the test antenna used for measuring the radiation.
2. The test sample and the measuring equipment shall be located over a wire mesh ground screen of 9 m long and 6 m wide. The wire mesh shall be considered as the reference earth for the measuring system.
3. The distance between the centre of the vertical projection of the test sample in the horizontal plane and the centre of the test antenna shall be 3 m.
4. Figure 1 shows the arrangement of the on-site setup.

### 3.3.2 Test antenna

1. The test antenna is used to detect the radiation from both the test sample and the substitution antenna during radiation measurement. The antenna shall be mounted at the end of a horizontal boom supporting by a vertical pole, both made of non-conducting material. The boom shall project at least 1 m from the vertical pole in the direction of the test sample and shall be arranged so that it can be raised and lowered through a range of heights from 1 m to 4 m. The fixings for the antenna shall permit it to be positioned for measuring the horizontal and vertical components of the electric field. The cable from the antenna shall be mounted along the horizontal boom and vertical pole.
2. For radiation measurements, the test antenna shall be connected to a selective measuring device capable of being tuned to any frequency under investigation. The test sample shall be placed on the test table at a height of 1 m above the plane of the test site.
3. Figure 2 shows the arrangement of conducting radiation measurement using the test antenna.

### 3.3.3 Substitution antenna

1. The substitution antenna shall be connected to a calibrated signal generator when the site is used for radiation measurement. It shall be a dipole of length equal to half a wavelength for each frequency concerned. The antenna shall be mounted in the way similar to that of test antenna, except that the centre of the antenna shall be located 1 m above the ground plane of the test site.
2. At frequency below about 100 MHz, this is impossible to achieve when the antenna is arranged for vertical polarization. In this case, the lower end of the dipole shall be 0.3 m above the ground.
3. Figure 3 shows the arrangement of conducting radiation measurement using substitution antenna.

### 3.3.4 Measuring equipment

1. The RF generator, if any, shall be placed at ground level. The selective measuring device may be placed on a suitable table or tripod near the bottom of the support for the test antenna.
2. The measuring instruments or the operator must not be so situated that they have an adverse influence on the measurement by causing reflections or affecting the antenna impedance, particularly when the

antenna are at a low height.

3. If the measuring equipment is supplied from the mains, its housing shall be connected to the wire mesh ground screen by a copper braid of minimum length with a width of at least 20 mm.
4. The vertical part of the cable connecting the selective measuring device and the mains supply shall be screened. The rest of the cable, and also the cable connecting the generator and the mains supply, shall be either screened and set at ground level, or shall be buried approximately 300 mm.

#### 4. TESTS

##### 4.1 Output Power of Transmitter

###### 4.1.1 Definition

1. For transmitter operating in the mode of frequency modulation, phase modulation or double sideband amplitude modulation, the output power shall be the measure of carrier power at the output terminals when they are connected to the nominal load condition specified by the manufacturer. The carrier power is the average power during one radio frequency cycle in the absence of modulation.
2. For transmitter operating in the mode of single sideband amplitude modulation, the output power shall be the measure of the peak envelope power at the output terminals when they are connected to the nominal load condition specified by the manufacturer.

###### 4.1.2 Method of measurement for transmitter operating in the mode of frequency modulation, phase modulation or double sideband amplitude modulation

With the equipment set up as shown in figure 4, the carrier power output shall be measured without modulation for a period of 30 minutes using one minute "transmit" and four minutes "standby".

###### 4.1.3 Method of measurement for transmitter operating in the mode of single sideband amplitude modulation

The output power delivered to the artificial load connected to the antenna terminals shall be measured by the method using two modulating oscillations given for single sideband transmitters in CCIR Recommendation 326-5.

#### 4.1.4 Limits

The output power shall not exceed +1.5 dB of the rated output power (see Clause 1.5) under normal test conditions.

## 4.2 Spurious Emissions of Transmitter

### 4.2.1 Definition

Spurious emissions are emissions at frequencies other than those of the carrier and sidebands associated with normal modulation resulting from signals generated within the equipment. The level of spurious emissions shall be measured as :-

1. their power level delivered from the transmitter output into a transmission line or antenna; and
2. their effective radiated power when radiated by the cabinet and structure of the equipment which is known as 'cabinet radiation'.

### 4.2.2 Method of measurement - power level delivered from the output of transmitter operating in the mode of frequency modulation, phase modulation or double sideband amplitude modulation

1. Spurious emissions shall be measured as the power level of any discrete signal delivered into a 50-ohm load. This may be done by connecting the transmitter output through an attenuator to a spectrum analyzer or selective voltmeter, or by monitoring the relative levels of the spurious signals delivered to an artificial load (non-reactive, non-radiating load of 50-ohm). Figure 5 shows the set up.
2. The transmitter shall be operated without any external source of modulation and the measurements made over the frequency range 100 kHz to 1000 MHz or four times the working frequency whichever is the greater, except for the channels on which the transceiver is intended to operate.
3. The measurements shall be repeated with the transmitter modulated with normal test modulation. The measurement shall be repeated with the transmitter in standby for equipment normally arranged for duplex operation.
4. The level of emission shall be measured relative to the carrier emission and the power level shall be determined by applying the ratio measured to the carrier power level.

#### 4.2.3 Method of measurement - power level delivered from the output of transmitter operating in the mode of single sideband amplitude modulation

The transmitter shall be driven to the rated output power by a modulating signal consisting of two audio frequency tones with a frequency separation between them such that all intermodulation products occur at frequencies at least 1500 Hz removed from the assigned frequency. Under these conditions, the power of any unwanted emission, at any discrete frequency, supplied to the artificial load connected to the antenna terminals shall be measured.

#### 4.2.4 Method of measurement - effective radiated power

1. In the measurement of cabinet radiation from a transmitter with antenna output terminals, the transmitter output shall be connected to a non-radiating artificial load.
2. The measurement shall be conducted at a test site and using test equipment conforming to clauses 3.3.1 to 3.3.4.
3. In the case of equipment operating in the mode of frequency modulation, phase modulation or double sideband amplitude modulation, the transmitter shall be tested without any modulation and with normal test modulation.
4. In the case of equipment operating in the mode of single sideband amplitude modulation, the transmitter shall be tested with modulation described in clause 4.2.3.
5. Radiation of any spurious components shall be detected by the test antenna and the selective measuring device over the frequency range 25 MHz to 1000 MHz or 4 times the working frequency, whichever is the greater. At each frequency at which an emission is detected, the sample shall be rotated and the test antenna shall be adjusted in height to obtain maximum response.
6. The sample shall be replaced by a signal generator and dipole antenna (substitution antenna) and the effective radiated power determined by a substitution measurement.
7. The measurements shall be repeated with the test antenna in the orthogonal polarization plane.

#### 4.2.5 Limits

The power of any spurious emission whether measured as output power level at the antenna terminals or effective radiated power in free space in the specified range of frequencies shall not exceed 4 microwatts for amplitude modulation and 0.25 microwatt for frequency modulation and phase modulation.

### 4.3 Spurious Emission of Receiver

#### 4.3.1 Definition

Spurious emissions from receivers are any emissions present at the antenna terminals of the equipment or radiated from the cabinet and structure of the receiver which is known as 'receiver cabinet radiation'.

#### 4.3.2 Method of measurement - terminal power

With the equipment set up as figure 6 (for equipment with antenna output terminals), the spectrum analyzer shall be tuned slowly and continuously over the frequency range of 100 kHz to 1000 MHz. The level of any spurious emissions observed shall be recorded.

#### 4.3.3 Method of measurement - effective radiated power

For measuring receiver cabinet radiation, the method of measurement shall be as described in Clause 4.2.4 except the test sample is a receiver.

#### 4.3.4 Limits

The power of any spurious emission whether measured as output power level at the antenna terminals or effective radiated power in free space shall not exceed 4 microwatts for amplitude modulation and 20 nanowatts for frequency modulation and phase modulation.

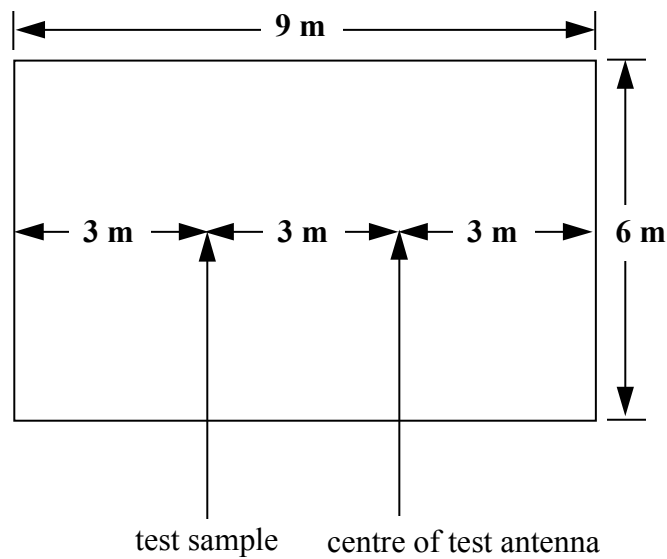
## 5. ACCURACY OF MEASUREMENT

The tolerance for the measurement of the following parameters shall be as follows :

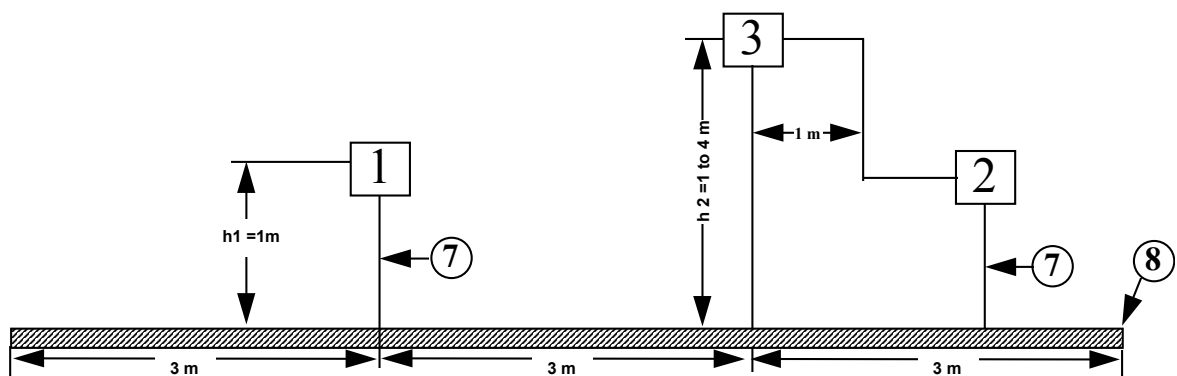
<u>Measurement</u>	<u>Tolerance</u>
DC voltage	± 3%
AC mains voltage	± 3%
AC mains frequency	± 1 Hz
Audio frequency voltage, power etc	± 0.5 dB
Distortion and noise etc of audio frequency generators	± 1%
Radio frequency	± 100 Hz
Radio frequency voltage	± 2 dB
Radio frequency field strength	± 3 dB
Radio frequency carrier power	± 2 dB
Impedance of artificial loads, combining units, cables, plugs, attenuators etc	± 5%
Source impedance of generators and input impedance of measuring receivers	± 10%

Explanation Notes for Figures 2 and 3

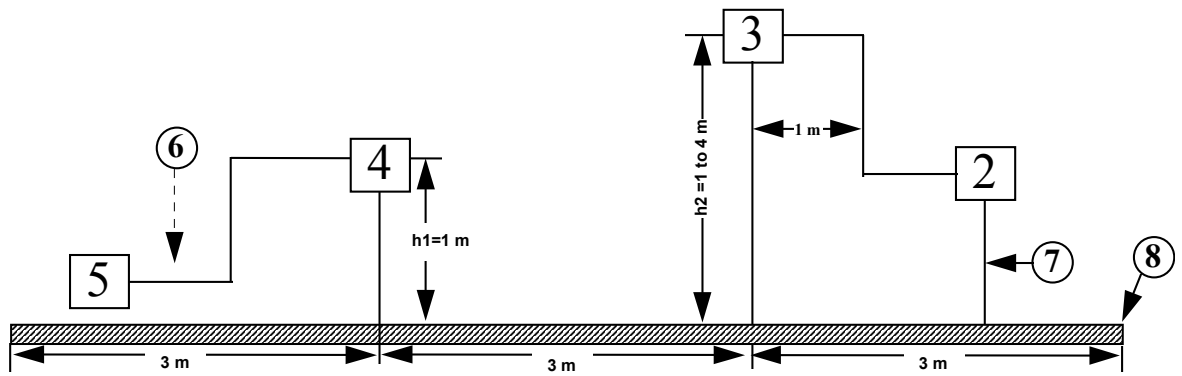
- 1 : test sample
- 2 : selective measuring device
- 3 : centre of test antenna
- 4 : centre of substitution antenna
- 5 : radio frequency signal generator
- 6 : output power meter
- 7 : earth connection and mains supply leads, if any
- 8 : wire mesh ground screen



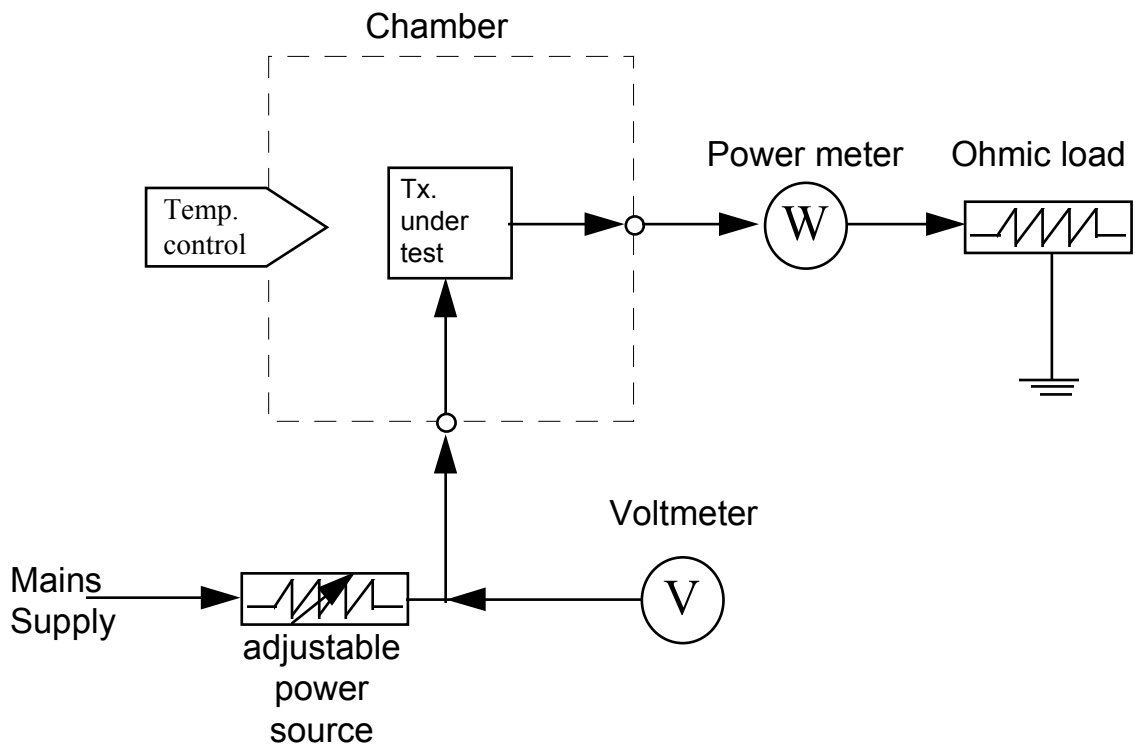
**Figure 1 : 3-metre Test Site**



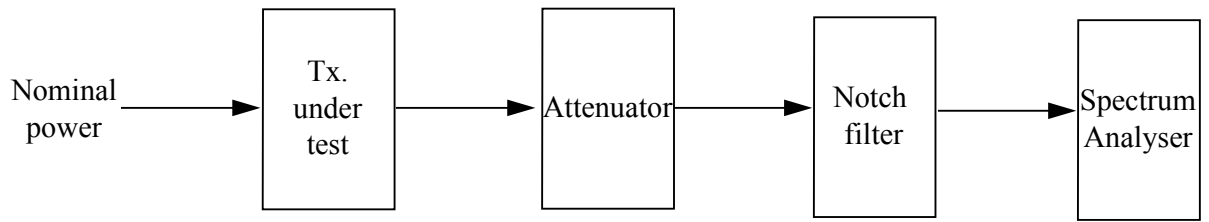
**Figure 2 : Radiation Measurement (using Test Antenna)**



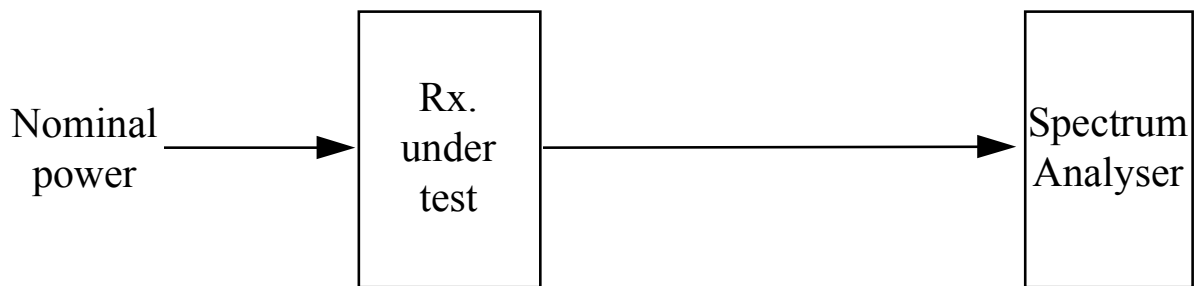
**Figure 3 : Radiation Measurement (using Substitution Antenna)**



**Figure 4 : Carrier Power Test Arrangement**



**Figure 5 : Spurious Emissions Test Arrangement - Power Level**



**Figure 6 : Receiver Spurious Emissions at Antenna Terminals**

## Annex 1

### Channelling Plan

Channel No.	Frequency Range (MHz)	Carrier Frequency (MHz)
1	26.960 - 26.970	26.965
2	26.970 - 26.980	26.975
3	26.980 - 26.990	26.985
4	27.000 - 27.010	27.005
5	27.010 - 27.020	27.015
6	27.020 - 27.030	27.025
7	27.030 - 27.040	27.035
8	27.050 - 27.060	27.055
9	27.060 - 27.070	27.065
10	27.070 - 27.080	27.075
11	27.080 - 27.090	27.085
12	27.100 - 27.110	27.105
13	27.110 - 27.120	27.115
14	27.120 - 27.130	27.125
15	27.130 - 27.140	27.135
16	27.150 - 27.160	27.155
17	27.160 - 27.170	27.165
18	27.170 - 27.180	27.175
19	27.180 - 27.190	27.185
20	27.200 - 27.210	27.205
21	27.210 - 27.220	27.215
22	27.220 - 27.230	27.225
23	27.250 - 27.260	27.255
24	27.230 - 27.240	27.235
25	27.240 - 27.250	27.245
26	27.260 - 27.270	27.265
27	27.270 - 27.280	27.275
28	27.280 - 27.290	27.285
29	27.290 - 27.300	27.295
30	27.300 - 27.310	27.305
31	27.310 - 27.320	27.315
32	27.320 - 27.330	27.325
33	27.330 - 27.340	27.335
34	27.340 - 27.350	27.345
35	27.350 - 27.360	27.355
36	27.360 - 27.370	27.365
37	27.370 - 27.380	27.375
38	27.380 - 27.390	27.385
39	27.390 - 27.400	27.395
40	27.400 - 27.410	27.405

**[Draft]**

**PERFORMANCE SPECIFICATION FOR  
26.96 – 27.41 MHz CITIZENS BAND (CB)  
RADIO TRANSCEIVERS**

**Telecommunications Authority  
Hong Kong**

## **FOREWORD**

1. This specification is prescribed under section 32D of the Telecommunications Ordinance (Cap 106) (“the Ordinance”) to set out the technical and evaluation requirements for Citizens Band (CB) radio transceivers operating in the frequency band 26.96 – 27.41 MHz in Hong Kong. Radiocommunications apparatus falling into the scope of this specification shall meet the stipulated requirements.
2. Under the Ordinance, the possession or use of any radiocommunications apparatus or any apparatus emitting radio frequency energy must be covered by an appropriate licence issued by the Telecommunications Authority (TA) with the exception of those specifically exempted from licensing under the Ordinance, such as those covered by the Telecommunications (Telecommunications Apparatus)(Exemption from Licensing) Order.
3. At present, the Office of the Telecommunications Authority (OFTA) operates a Hong Kong Telecommunications Equipment Evaluation and Certification (HKTEC) Scheme. Details of the HKTEC Scheme can be found in the information note OFTA I 421. Under the Scheme, suppliers or manufacturers of the radiocommunications apparatus shall apply to OFTA for certification of their apparatus against this specification. The application procedures for certification of radiocommunications apparatus can be found in the information note OFTA I 401.
4. The TA reserves the right to give separate certification to models he considers to be technical variants and the performance of which may differ between models.
5. The TA may amend any part of this specification as and when he deems necessary.
6. In case of doubt about the interpretation of this specification, the methods of carrying out the test and the validity of statements made by the equipment manufacturers or suppliers about the equipment, the decision of the TA shall be final.

7. The HKTA specifications and information notes are issued by the TA. The documents can be obtained through one of the following methods —

- downloading direct through the OFTA's Internet Home Page. The Home Page address is <http://www.ofta.gov.hk>;
- making a request for hard copies to :-  
Radio Laboratory,  
Standards Section,  
Office of the Telecommunications Authority,  
29/F Wu Chung House,  
213 Queen's Road East,  
Wanchai,  
Hong Kong.

Fax: +852 2343 5824

Email: [radiolab@ofta.gov.hk](mailto:radiolab@ofta.gov.hk)

8. Enquiries about this specification may be directed to —

Radio Laboratory, Standards Section,  
Office of the Telecommunications Authority,  
29/F Wu Chung House,  
213 Queen's Road East, Wanchai, Hong Kong.

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## **CONTENTS**

1. Scope of specification
2. Operation frequencies
3. Modulation
4. Technical Requirements

## ANNEX

Annex 1 : Channelling Plan

## **1. SCOPE OF SPECIFICATION**

This specification covers the minimum performance requirements for CB radio transceivers operating in the frequency band 26.96 – 27.41 MHz for voice communications.

## **2. OPERATING FREQUENCIES**

The operating frequencies of the equipment shall conform to the channelling plan specified in Annex 1. The channel spacing is 10 kHz. The equipment shall not be capable of operating at frequencies other than those specified in Annex 1.

## **3. MODULATION**

Any one of the following modulation methods will be acceptable :-

1. Frequency modulation
2. Phase modulation
3. Double sideband amplitude modulation
4. Single sideband amplitude modulation

## **4. TECHNICAL REQUIREMENTS**

(a) The equipment operating in the frequency band 26.96 – 27.41 MHz shall meet the technical requirements as defined in one of the following standards:-

- (i) ETSI Standard EN 300 135-2 “Electromagnetic compatibility and Radio spectrum Matters (ERM); Angle-modulated Citizens Band radio equipment (CEPT PR 27 Radio Equipment); Part 2: Harmonized EN covering essential requirements under article 3.2 of R&TTE Directive” published by the European Telecommunications Standards Institute (ETSI);

- (ii) ETSI Standard EN 300 433-2 “Electromagnetic compatibility and Radio spectrum Matters (ERM); Land Mobile Service; Double Side Band (DSB) and/or Single Side Band (SSB) amplitude modulated citizen’s band radio equipment; Part 2: Harmonized EN covering essential requirements under article 3.2 of R&TTE Directive” published by the European Telecommunications Standards Institute (ETSI);
  - (iii) Code of Federal Regulations (USA); Title 47 Telecommunication; Chapter 1 Federal Communications Commission, Part 95 “Personal Radio Services”; Subpart E – Technical Regulations.
- (b) The carrier power of the equipment shall not exceed 4 watts. The peak envelope power shall not exceed 12 watts for single sideband amplitude modulation.

**- END -**

## Annex 1

### Channelling Plan

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