

**For discussion  
on 6 April 2006**

**Legislative Council  
Panel on Information Technology and Broadcasting**

**Spectrum Allocation for FM Broadcasting**

**Purpose**

This paper informs Members of the following:

- (a) the planning of 87 – 108 MHz frequencies in the Very High Frequency (VHF) band for territory-wide frequency modulated (FM) sound broadcasting services (“services”); and
- (b) the feasibility of re-developing the existing frequency plan in the 87 – 108 MHz band (“VHF/FM Plan”) for accommodating more services.

**Background**

2. According to the frequency allocation by the International Telecommunication Union, the frequencies in the 87 – 108 MHz band are used by all jurisdictions in the world for the provision of FM sound broadcasting services. In Hong Kong, frequencies in the 87 – 108 MHz band were initially allocated to sound broadcasters by the then Post Office on an ad hoc basis. In the early 1980’s, the Government appointed a consultant to develop a VHF/FM Plan with a view to improving the coverage of the FM sound broadcasting services and maximizing the number of such services.

**Considerations in Developing the VHF/FM Plan**

3. In developing the VHF/FM Plan, the Government took into

consideration the following requirements:

- (a) maximizing the number of territory-wide coverage services;
- (b) sharing the use of frequencies with our neighbouring territories including Guangdong and Macau based on the principle of equitable use of frequencies conforming to the international practice; and
- (c) ensuring that the aeronautical services and navigational facilities in Hong Kong and our neighbouring territories would not be interfered.

4. Taking into account the requirements mentioned in paragraph 3 and after reaching agreement with the spectrum management authorities in the Mainland and Macau, the Government has adopted the existing VHF/FM Plan since the late 1980's.

### **Uses of FM Frequencies**

5. There is 21 MHz bandwidth of frequency spectrum in the 87 – 108 MHz band. However, we cannot use all the frequencies in the band for the following reasons:

- (a) Hong Kong is in close proximity to Guangdong and Macau. High power FM broadcasting signals originated from Hong Kong spill over into neighbouring territories and vice versa. Conforming to the international practice, we need to share the use of the frequencies in the 87 – 108 MHz band with Guangdong and Macau based on the principle of equity;
- (b) In order to avoid mutual interference, high power FM sound broadcasting requires adequate frequency separation among different frequency channels, and/or adequate distance separation among different transmission stations using the same or adjacent frequency channels. Due to the small size of Hong Kong, distance separation is not possible. Frequency

separation by leaving some frequency channels vacant, i.e., un-used, is the only technical solution; and

- (c) Some of the frequency channels in the 87 – 108 MHz band cannot be used because the use of them may produce inter-modulation frequencies that may cause interference to the aeronautical services and navigational facilities.

6. According to the VHF/FM Plan, Hong Kong requires seven hilltop sites, each of which transmits sound broadcasting signals at different frequency channels of a bandwidth of about 200 kHz (i.e., 0.2 MHz), to provide seven territory-wide FM services. In other words, typically a bandwidth of at least 1.4 MHz is required for one territory-wide service. For example, the Commercial Radio One Channel is transmitted on the frequency band of 88.1-89.5 MHz throughout the territory. To avoid interference, frequencies used at one hilltop site cannot be used elsewhere. A table showing the frequencies used to broadcast the seven domestic FM radio programme channels is at **Annex**. The frequency gap between two neighbouring radio programme channels is in the range of 0.3-0.8 MHz only. Presently a total of 9 MHz (i.e., about 43%) out of the 87 – 108 MHz band is being used for FM services in Hong Kong.

Annex

7. Out of the 87 – 108 MHz band, a total of 12 MHz (i.e. about 57%) cannot be used by Hong Kong to provide territory-wide FM services owing to the reasons stated in paragraph 5 above. The use of these frequencies will cause interference with the FM sound broadcasting services, aeronautical services and navigational facilities in Hong Kong, Macau and Guangdong.

### **Feasibility of Re-developing the VHF/FM Plan**

8. Once we have implemented the VHF/FM Plan, any significant change to the VHF/FM Plan cannot be made by Hong Kong unilaterally. We need to obtain prior agreement from our neighbouring territories as any significant change to our VHF/FM Plan will cause interference with the FM sound broadcasting services, aeronautical services and navigational facilities in Hong Kong, Macau and Guangdong unless all are willing to make the corresponding changes to their existing VHF/FM Plans. Such

corresponding changes will not only incur significant costs by all the concerned operators and regulators, but will also cause inconvenience to the audiences in Hong Kong as well as those in the neighbouring territories.

## **Conclusion**

9. The existing VHF/FM Plan is already the result of optimal frequency planning to make the most efficient use the 87 – 108 MHz band to support the maximum number of territory-wide services.

**Office of the Telecommunications Authority**  
**April 2006**

## FM Frequency Table

<b>Radio Programme Channel</b>	<b>Frequencies (MHz)</b>	<b>Frequency Gap (MHz)</b>
CRHK Radio 1	88.1-89.5	0.8
CRHK Radio 2	90.3-92.1	
		0.5
RTHK Radio 1	92.6-94.4	0.4
RTHK Radio 2	94.8-96.9	
		0.7
RTHK Radio 4	97.6-98.9	0.8
Metro Showbiz	99.7-102.1	
		0.3
Metro Finance	102.4-106.3	