RADIO SPECTRUM AND TECHNICAL STANDARDS ADVISORY COMMITTEE

Channel Arrangement in the 26 GHz Band

Purpose

This paper proposes the channel arrangement for fixed links operating in the 24.5 – 26.5 GHz band (the "26 GHz band").

Background

2.   The International Telecommunication Union Radiocommunication Sector ("ITU-R") published ITU-R Recommendation F.748 to specify the channel arrangement for fixed links in the 26 GHz band, with the latest version being F.748-4.

3.   In Hong Kong, the 26 GHz band is allocated to fixed service for Local Wireless Fixed Telecommunication Network Services ("LWFTNS") employing Local Multipoint Distribution Service ("LMDS") technology.   Since the licensing of LWFTNS in 2000, some frequency assignments at 26 GHz have been withdrawn due to termination of a few LWFTNS licences.   In this connection, the unassigned spectrum in the 26 GHz band can be made available for fixed links to meet the demand of other services.

4.   The mobile network operators ("MNOs") have been operating fixed links in the 11 GHz, 18 GHz, 23 GHz and 38 GHz bands as backhauls of their networks.   With the increase in customer demand for mobile broadband services, the demand of frequency spectrum by MNOs for fixed links of short to medium length has been increasing.   The 26 GHz band is considered to be suitable for used by the mobile industry for fixed links of the backhauls of their networks.   Since LMDS technology adopts a different channel arrangement to fixed links, it is necessary to revise the current channel arrangement at some 26 GHz sub-bands to cater for fixed link applications.

Proposed Channel Arrangement

5.   According to ITU-R Recommendation F.748-4, the 26 GHz band is divided into the lower half band (24.549 – 25.445 GHz) and the upper half band (25.557 – 26.453 GHz) with a 112 MHz guard band in between. The lower half band and upper half band form the "go-and-return" paired channels with 3.5 MHz channel building blocks. 3.5 MHz, 7 MHz, 14 MHz, 28 MHz, 56 MHz and 112 MHz are standardised channel widths.

6.   Having considered the availability of spectrum at the 26 GHz Band, 24.549 – 24.8465 GHz, 24.997 – 25.144 GHz, 25.294 – 25.445 GHz paired with 25.557 – 25.8545 GHz, 26.005 – 26.152 GHz, 26.302 – 26.453 GHz respectively could be allocated for fixed link services. The number of channels available for fixed links, with respect to different channelling plans, is listed below:

Channel width (MHz)	3.5	7	14	28	56	112
Number of paired channels	170	84	41	20	9	4

7.   As a reference, the channel arrangement for fixed links operating in the 23 GHz band is also in multiple of 3.5 MHz, allowing up to 28 MHz. For 28 MHz channelling plan in the 26 GHz band, 20 paired channels would be available. The number of paired channels would be reduced to nine for 56 MHz channelling plan and would be further reduced to four for 112 MHz channelling plan. Considering that large channel width would render frequency reuse more difficult and higher throughput can be equally attained by dual polarisation, channel widths up to 28 MHz are proposed to be adopted in Hong Kong for fixed links operating in the 26 GHz band. Accordingly, the channelling plans of ITU-R Recommendation F.748-4, which allow for channel widths ranging from 3.5 MHz to 28 MHz, are proposed to be adopted in Hong Kong. The proposed channel arrangement details are given at <u>Annex 1</u>.

Advice Sought

8.   Members are invited to offer their views and comments on the proposed channel arrangement of the 26 GHz band as set out in paragraphs 5 to 7 above.

Office of the Communications Authority
**June 2012**

RR Allocation

FIXED INTER-SATELLITE MOBILE RADIONAVIGATION	FIXED INTER-SATELLITE MOBILE	FIXED FIXED-SATELLITE (Earth-to-space) MOBILE	FIXED INTER-SATELLITE MOBILE Standard frequency and time signal-satellite (Earth-to-space)		EARTH EXPLORATION-SATELLITE (space-to-Earth) FIXED INTER-SATELLITE MOBILE SPACE RESEARCH (space-to-Earth) Standard frequency and time signal-satellite (Earth-to-space)

24.45   24.65   24.75   25.25   25.50   27.00 GHz

HK Allocation

FIXED RADIONAVIGATION	FIXED	FIXED FIXED-SATELLITE (Earth-to-space)	FIXED

24.45   24.65   24.75   25.25   27.00 GHz
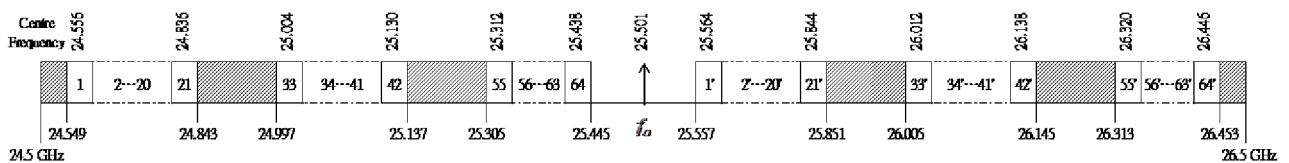
Channel Arrangement

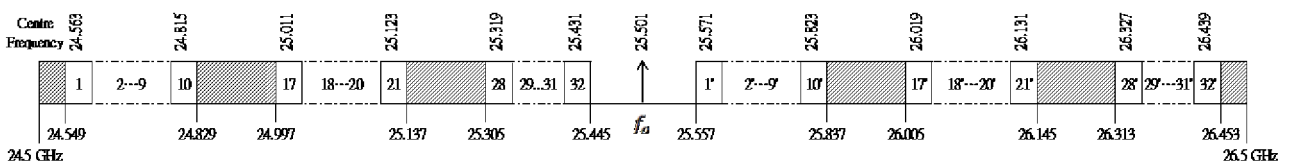### Assignment of 3.5 MHz channels
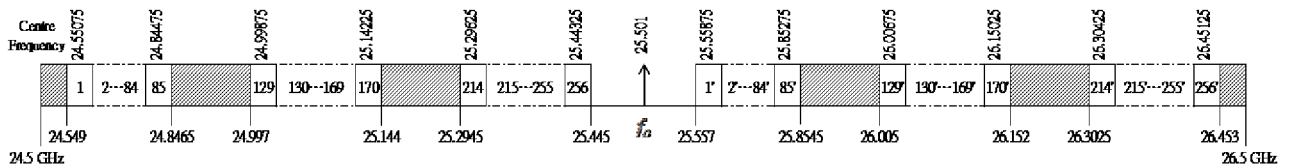
Assignment of 7 MHz channels
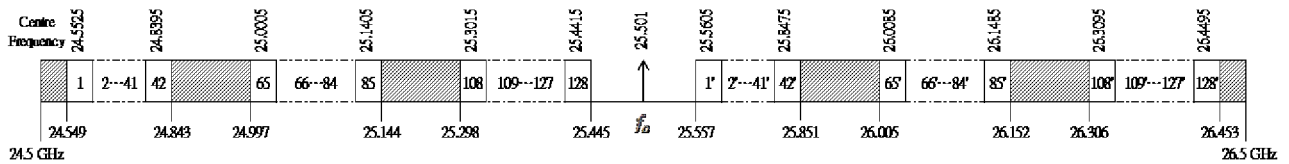
Assignment of 14 MHz channels

Assignment of 28 MHz channels

	Lower half band (MHz)	**Upper half band (MHz)**

Assignment of
3.5 MHz channels

$$f_n = f_o - 953.75 + 3.5n \qquad f_n' = f_o + 54.25 + 3.5n$$

where n=1, 2, 3, … 85, 129, 130, 131, … 170, 214, 215, 216, … 256

Assignment of
7 MHz channels

$$f_n = f_o - 955.5 + 7n \qquad f_n' = f_o + 52.5 + 7n$$

where n=1, 2, 3, … 42, 65, 66, 67, … 85, 108, 109, 110, … 128

Assignment of
14 MHz channels

$$f_n = f_o - 959 + 14n \qquad f_n' = f_o + 49 + 14n$$

where n=1, 2, 3, … 21, 33, 34, 35, … 42, 55, 56, 57, … 64

Assignment of
28 MHz channels

$$f_n = f_o - 966 + 28n \qquad f_n' = f_o + 42 + 28n$$

where n=1, 2, 3, … 10, 17, 18, 19, 20, 21, 28, 29, 30, 31, 32

where $f_o = 25501\ MHz$;

f_n is the centre frequency of a channel in the lower half band;

f_n' is the centre frequency of a channel in the upper half band.