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FREQUENCY LAYOUT PLAN OF IN-BUILDING COAXIAL CABLE DISTRIBUTION SYSTEMS

Comments expressed at and after the Industry Workshop held on 11 June 1999 and OFTA's Responses 14 July 1999

Background

On 31 March 1999, the Office of the Telecommunications Authority (OFTA) issued a consultation paper on the frequency layout plan of in-building coaxial cable distribution systems (IBCCDSs), the technical standards for the distribution systems and the associated set-top boxes for the introduction of new telecommunications and television services (the Consultation Paper). After the consultation period, a total of 55 submissions were received. The result of the public consultation with OFTA's initial responses was published on 8 June 1999. These papers are available in OFTA's website¹

Comments Expressed at and after the Industry Workshop

2. On 11 June 1999, OFTA conducted an industry workshop to present the results of consultation and OFTA's initial responses and invite the attendees to express further views and comments on the Consultation Paper. The notes of discussions of the Industry Workshop held 11 June 1999 are given in Annex 1 for information. After the workshop, three further submissions were received and the submissions are given in Annex 2. A summary of the comments received is given below:

¹ The relevant papers can be downloaded from OFTA's website:-

- Consultation Paper - <http://www.ofta.gov.hk/report-paper-guide/paper/consultation/ibccds.pdf>
- 55 submissions - <http://www.ofta.gov.hk/report-paper-guide/report/list-of-submissions.html>
- Results of consultation and OFTA's initial responses –
<http://www.ofta.gov.hk/report-paper-guide/report/rp990608.pdf>

Interference to Mobile Phones

- (a) There were concerns that the IBCCDS might cause interference to mobile phones.

Set-top Box

- (b) The standards of the core elements should be placed in the public domain.
- (c) The technical information of the conditional access systems and the interface of the set-top box should be disclosed so that anyone could manufacture the set-top boxes.
- (d) Whether or not the set-top box was for sale to the consumer or provided as part of the service should be taken into account when considering the adoption of a single set-top box standard. The consumer might have objection if he had to buy three set-top boxes to get three different services rather than to have three set-top boxes to be provided as part of the services.
- (e) The Government should encourage cooperation between network operators and carriers on set-top box to prevent consumers having different set-top boxes. The Government should also disallow any practice in the market which uses hold-up cost to prevent the consumer switching from one set-top box to another.
- (f) OFTA should work with all licensees to encourage a move towards a common standard for set top box.
- (g) More channels should be allocated to radio frequency (RF) outputs of set-top boxes.
- (h) It is not possible or beneficial to any party to attempt to set a standard for a common set-top box at this stage. Setting such standards will be a great departure from the Government's stated position of technical neutrality.

- (i) It is a fact that there would be multiple boxes because all these boxes do different things.

Frequency Allocation Plan for IBCCDS

- (j) There should be a number of standard frequency patterns from which the optimum could be chosen instead of a single frequency plan.
- (k) To limit the number of channels allocated to telecommunications services to 6 may limit the services offered by the wireless local loop operator and may create a situation which makes it not a viable business.
- (l) Existing dual riser IBCCDSs should be developed as parallel cable systems to increase the channel capacity.
- (m) Any operator who is required to relinquish channels to other licensees should be allowed to utilize suitable "spare" channels that are not immediately required by other licensees.
- (n) The primary use of IBCCDSs is for the delivery of television services and will be required for that purpose for the foreseeable future. Spectrum allocation should ensure that television carriage takes priority over telecommunications service delivery and that pressure on capacity from telecommunications services should be met by techniques that increase bandwidth rather than curtailment of television services.
- (o) There should be a guard band between the upstream and downstream signals.
- (p) Except for digital terrestrial television (DTT) priorities should be set on data rate of delivered payload and the number of services to be delivered.

Database of IBCCDS

- (q) To facilitate system planning by service providers, in-depth information on all IBCCDSs should be published.

OFTA's Responses

Interference to Mobile Phones

3. There is a specification, HKTA 1102, on the radiation limits for cable systems. If all cable systems follow the radiation limits, there should be no interference caused to mobile phones. Experience is that the reverse is true. Cable systems in fact suffer from interference caused by the mobile phone and radio paging transmitters at rooftops.

Set-top Box

4. OFTA considers that the ideal solution is to have a universal standard for set-top box so that a single set-top box can be used to convey all services. In addition, the security functions should be separated from the non-security functions and the service providers should provide the technical information concerning the interface parameters so as to facilitate the emergence of a competitive marketplace for set-top boxes. However, this is not technically possible at this stage. OFTA considers that all issues related to the set-top box should be reviewed in around 2001 when the policy on DTT is finalized. Meanwhile, concerns about access and competition will be dealt with by two methods. One is by way of sections 36A, 36B and 36C of the Telecommunication Ordinance in the sharing of and connection to set-top boxes. Second is by way of a new provision concerning the access of service in the Telecommunication (Amendment) Bill 1999.

5. OFTA reiterates that the reservation of 3 channels for RF outputs of set-top boxes for all service providers is sufficient and further allocation is not necessary. This is because most TV sets and video cassette recorders (VCRs) nowadays are already equipped with audio/video (A/V) inputs for connection of set-top boxes.

Frequency Allocation Plan for IBCCDS

6. Having considered the views and comments received, OFTA is of the view that an 8 MHz channel plan with the use of all adjacent channels should be adopted to maximize the number of available channels. The fixed channel plan will not be pursued.

7. OFTA reiterates that the frequency spectrum within the IBCCDSs constitutes scarce resources for the delivery of telecommunications and broadcasting services into the users' premises in multi-storey buildings. Meanwhile, the installation of a second horizontal drop cable is difficult in practice in most existing building and the drop cable remains a bottle-neck. Given the congestion in the drop cable, OFTA considers that the frequency spectrum in the IBCCDS should be assigned according to the proposed priorities for distribution in IBCCDS. It is further proposed that 3 contiguous channels in the VHF band and 3 contiguous channels in the UHF band should be used for telecommunications services at this stage. Adjustment may be made after studying all the applications for television and television services.

8. In order to promote efficient use of frequency spectrum, priority in the allocation of frequency spectrum in IBCCDS will be given to services using digital or other spectrally efficient technology and a minimum data rate of around 20 Mbps for an 8 MHz channel should be used for digital transmission. OFTA concurs that there should be a guard band to separate the upstream and downstream signals. A guard band of 3.275 MHz should be appropriate.

Database of IBCCDS

9. OFTA considers that the proposed information to be included in the database of IBCCDS should be sufficient. Any further addition will likely create concerns on privacy and commercial sensibility.

Office of the Telecommunications Authority
14 July 1999

**Notes of discussions in the Industry Workshop on
Frequency Layout Plan of the
In-building Coaxial Cable Distribution Systems
Conducted by OFTA
on Friday, 11 June 1999 from 10:00 a.m. to 11:50 a.m.
at Harcourt Room, Conrad International Hong Kong, Hong Kong**

Panel Members

Mr K S Wong - OTFA (Chairman)
Mr Eddie Mak - ITBB (Member)
Mr T Y Chan - OFTA (Member)

75 persons from 32 companies, organizations and government departments attended the workshop.

2. The Chairman welcomed the audience and said that the purposes of the Industry Workshop were to present the results of the consultation on Frequency Layout Plan of In-building Coaxial Cable Distribution Systems (the Consultation Paper) and OFTA's initial response. He added that the workshop would be for attendees to offer further views on the subject after having seen the submission from other parties.

3. The Chairman presented the results of consultation and OFTA's initial response and invited the audience to express further views and comments on the Consultation Paper. He requested the audience to identify themselves before they expressed their views.

4. Mr Nick Tomlinson of Hong Kong Telecommunications Limited asked the guarantee about interference to mobile phones. The Chairman explained that there was a specification, HKTA 1102, on the radiation limits for cable systems. If all cable systems followed the radiation limits, there should be no interference caused to mobile phones. He remarked that experience was that the reverse was true. Cable systems in fact suffered from interference caused by the mobile phone and radio paging transmitters at rooftops.

5. Mr Eric Spain of Auitel Ltd. said that some of the wireless local loop (WLL) systems which were being considered on the 24 GHz band would distribute 100 MHz channels including telephony, data and television. He queried whether the proposal of reserving 3 contiguous channels in the VHF band and 3 contiguous channels in the UHF band for telecommunications services would meet the demand. In response, the Chairman said that if all WLL systems choose to use the IBCCDS to distribute the signals, we had to examine the total demand. In the next exercise when applications were invited to apply for telecommunications and television service licences, OFTA would be able to examine whether there was a supply and demand problem.

6. Mr Eric Spain was of the opinion that the industry did not want to have a common standard because they seemed to have the idea that by allowing competition they would not have some edge on the market. He was concerned that competition would be destroyed if a company used a technology to dominate and take over the market. He considered that a separate more in-depth workshop, not just an industry workshop, should be conducted because the implication of the proposals in the Consultation Paper was not understood widely among people outside the industry.

7. Mr Ron Cameron of the Consumer Council said that the Council supported OFTA's proposal that there should be a single standard for the set-top boxes. The Chairman clarified that in the long run OFTA hoped to have a single standard but not at this stage.

8. Mr Gary Davey of STAR TV said that the DVB and MPEG 2 standards were incomplete and had limitations. He was of the opinion that digital technology was advancing so quickly that it was not appropriate to set too detailed requirements for the set-top boxes at this stage. As regards the concern about too many boxes in the home, Mr Gary Davey was of the view that it was a fact that there would be multiple boxes because all these boxes do different things. Mr Eric Spain considered that the ideal solution would be a single set-top box which might be partly software operated and the consumers could have smart cards from different operators for access to the services.

9. Mr Victor Hung of Consumer Council said that the Council's position was that the Government should encourage cooperation between network operators and carriers on set-top box to prevent consumers having different set-top boxes. The Government should also disallow any practice on the market which used holdup

cost to prevent the consumer switching from one set-top box to another.

10. Mr Eric Spain considered that the technical information of the conditional access systems should be disclosed so that anybody could manufacture the set-top boxes.

11. The Chairman said that the ideal solution was that the set-top boxes, like telephones and personal computers, could be competitively supplied. The set-top boxes should be standardized and could convey all services. However, at this stage, there was not much support from the consultation on this. We should be able to look at the whole matter of electronic programme guide, access, competition and all related issues of set-top boxes when the policy on DTT was to be developed. Meanwhile, we hoped to be able to deal with the concerns about access and competition by two methods. One was by way of sections 36A, 36B and 36C of the Telecommunication Ordinance in the sharing of and connection to set-top boxes. Second was by way of a new provision concerning the access of service in the Telecommunication (Amendment) Bill 1999.

12. Mr Gerard Hadfield of Hong Kong Telecom IMS said that whether or not the set-top box was for sale to the consumer or provided as part of the service should be taken into account when considering the adoption of a single set-top box standard. He was of the opinion that the consumer might object more if he had to buy three set-top boxes to get three different services rather than to have three set-top boxes to be provided as part of the services. The Chairman noted the proposal.

13. Mr Eric Spain suggested that the interface of the set-top box should be disclosed. The Chairman noted the proposal.

14. The Chairman summarized and said that the issue of set-top box was quite complex, and invited written comments to OFTA on or before 19 June 1999. OFTA would finalize the proposals for decision by the Telecommunications Authority.

15. The workshop adjourned at 11:50 a.m.

Office of the Telecommunications Authority
21 June 1999

**Further Submission 1
by Satellite Television Asian Region Ltd**

1. 3 frequencies for set-top box (STB) modulated output, and the use of adjacent channels for STB for all new licensees

Firstly, we would like to point out again that all consumer grade STB have double sideband modulated outputs. This means the output actually occupies two 8 MHz channels instead of one, as may have been assumed by OFTA. The proposed allocation of 3 UHF frequencies can only permit one operator's STB to utilize the allocated frequencies. We therefore propose that the current proposal be amended so that an allocation of a multiple of two to the proposed three frequencies be put to the STB output.

Secondly, OFTA has specified that STB for all new licensees be operated on adjacent channels. As expressed in our previous submission, we accept this for STB reception characteristics, but not for STB modulated output, the reason being that consumer grade devices do not support adjacent channel operation with their modulated outputs. As we are at the final stage for STB product development, we urgently seek clarification on this matter.

2. 20 Mbps minimum bandwidth per 8 MHz channel for all new licensees

STAR TV understands OFTA's difficulties in setting a minimum number of services to be carried on each 8 MHz channel. This should only be applied to DTT, where terrestrial modulation formats generally deliver lower capacity than satellite or cable. Therefore DTT licensees can be considered separately from other pay TV operators, which is likely to be the case given the special nature and universal coverage requirements of terrestrial services.

With other licensees, priorities should be set on Mbps of delivered payload, and the number of services to be delivered. If STAR is granted a pay TV license, it will be delivering over 40Mbps for most of its requested frequencies, and delivering more than 8 services for each of these channels. Our concern is that other prospective licensees will request IBCCDS channels for delivering one or

two TV services, and be granted a far greater number of frequencies than they need. We urge the OFTA, in light of the scarce and limited resource, to consider allocating frequencies to companies who are delivering a wide array of services to enrich the viewing of the HK public.

STAR is concerned that the increasing interest of a few telecommunications companies in the use of IBCCDS, will lead to speculative activity by others to be granted frequencies for the launch of some 'questionable' services, in order to gain financial benefit by "selling" this capacity to a third party. We suggest in its final policy statement OFTA should state that the merger of a pay TV licensee with another one or with another telecommunications company will require the allocated capacity to be returned subject to a review of the new companies requirements and those of other existing licensees.

3. Allocation of 4 frequencies for STAR TV existing analogue services

We understood from the initial public consultation paper that STAR TV, as an existing licensee, would be allocated 4 frequencies on all IBCCDS for the continued distribution of our existing services. We feel this arrangement is in the best interest of the public as most of them have accustomed to watching these channels in the past eight years. We request clarification that our understanding of the Government intention is correct.

4. Information to be provided on IBCCDS

STAR TV considers that OFTA, in the results of the public consultation, did not fully reflect our views on the comprehensive nature of the information that should be provided on SMATV and all other IBCCDS. STAR has a number of reasons why such information will be essential to all new pay TV operators, and will also be important to OFTA in its role of regulating this industry.

- (i) All new pay TV licensees will need in-depth information on all IBCCDS in order to make their business plans for roll-out of their new services. They will need to know the available capacity, and which licensees are currently present, and what services they are currently distributing. A number of key systems in HK are currently distributing a large number of services, such that the capacity is limited, and service priority may need to be invoked to permit a new licensee access to a system. OFTA needs to be

aware of the status of such systems, as it will be the arbitrator of requests from licensees.

- (ii) STAR TV has for some time been concerned that its distribution in SMATV has been declining, due to the actions of a SMATV company. Public distribution of OFTA statistics regarding the services distributed in IBCCDS will enable licensees to be fully appraised of their position, and also highlight any anomalies to OFTA, in particular where unfair competitive practices may be taking place.

Please refer to our submission with respect to the information that should be provided on IBCCDS systems.

5. Temporary use by HK Cable TV of 5 VHF Channels

STAR TV expects these channels to be made available to companies tendering for pay TV licenses. When STAR submits for a license we will be requesting the use of these 5 frequencies. The use of these frequencies will confer a number of operational benefits in our use of digital technology. They will provide a single set of frequencies for use across all IBCCDS in HK. This means that all IRDs can be factory configured for these frequencies, and not require configuration on a building by building basis, as would be necessary if UHF channels were used in existing systems.

We understand that the stipulated date for the return of these channels has already passed. We need to know when HKCTV will cease using this capacity as we would like to undertake performance tests on a number of IBCCDS in Hong Kong.

On all these points STAR would like to have discussions with OFTA in the near future.

6. Common Set Top Box Issues

STAR TV reiterates its views in the previous submission, and agrees with the majority of respondents to the consultation process, that it is not possible or beneficial to any party to attempt to set a standard for a common STB at this time.

On the most basic of requirements, which is the ability to receive DTT, satellite, cable and ITV signals, there is no STB worldwide which can do this. It is also extremely unlikely that there will ever be a commercially available device that can receive such signals, even 5 years hence. If such a device was mandated, it would be an expensive unit, which would disadvantage consumers, and raise an unwarranted entry barrier to the digital technology by the public and thereby hindering the business success of any pay TV operators.

Setting such standards will be a great departure from the Government's stated position of technical neutrality.

Also, regulators in other jurisdictions such as Singapore and UK have rejected the notion of having a universal interface to all systems and accepted the fact that different STB be made available for different systems. We therefore reiterate the views expressed in our submission and support OFTA that the issue be fully reviewed in 2003.

Further Submission 2
by Mr Eric Spain

1 Set-top-boxes

- 1.1 I think that the discussion which took place at the industry workshop was a very small indication of the problems which we face.

Some of the points that Mr. Davey of STAR were interesting but open to argument. For example, his implication that the protocols for his conditional access are in the public domain needed to be pursued but it was not possible in such a large gathering.

- 1.2 It seems to me that, despite the policy of 'technological neutrality', the standards relating to the basic channelling for digital TV contain, in fact, quite a lot of standardisation. It is the other uses which are not defined and open to proprietary development.

In view of this, we might consider that all the elements in the main channels providing TV might be standardised but leave the other services to proprietary standards. In this way it would ensure an open standard for competitive TV but allow development on top of this of other services.

This might include an underlying standard for conditional access within which operators could provide their individual access protocols but, if they wanted to do more, there would be no restriction.

- 1.3 This could lead to the possibility of a range of set-top box design from the simplest - which would handle all TV channels - to proprietary units giving more complex functions and other services.

Whilst Star TV say that many manufacturers making their set-top-boxes, I doubt if it means that such manufacturers could, in future, make set top boxes which would also handle competitor's services.

When one considers the layers in the media pile, the feature of the new digital environment is that each layer can be owned by different people (unlike the

present situation with analogue). In particular, the bottom layer -- the consumer's equipment -- should not be under the control of those providing the programmes but a quite separate industry as with other media such as video recorder, CDs and DVDs.

If it is not possible to set a single standard, then the standards of, at least the core TV elements, should be required to be in the public domain so that anyone can design solutions. In this way, we might get to the single set-top-box quicker.

- 1.4 The meeting was an 'industry workshop'. However, that only means the industry of the present. The Digital environment will greatly increase the number and type of players.

Whilst it is not possible to identify exactly who these players might be, I would suggest that we might try to broaden the net and, in the future, include some of the people in industries which are likely to merge into the digital broadcasting environment. The risk of restricting invitees to the present players is that they will obviously wish to keep as much as they can unto themselves and the result will be a distortion in the facts and factors entering into the debate of the future framework.

- 1.5 This 'absence of future members' leads me, again, to repeat my previous strong recommendation that OFTA spends more resource on becoming expert in this whole field. Only by having independent expertise equal to that held within the present industry can we ensure that the future industry will reap the full benefits of the future technologies and not be hampered by vested interests of the present.

As well as this, I suggest that a working group be instituted to argue through these issues and try to determine the facts of the situation. However, this will be useless unless there are resources for it to become expert and knowledgeable.

- 1.6 Whilst I think it probably necessary to delay final consideration of STBs to 2001, I am concerned that, in the meantime, some companies will just set the standards and/or create a dominance which will never be overcome. Prior to 1973, a large proportion of TV antennas were placed to get TVB by reflections. When RTV started, these antennas could not receive it. The situation before us

is, of course, not the same technically but analogous in that the technology created a dominance which ATV/RTV have never been able to surmount.

Furthermore, the whole situation has to be resolved before the new satellite licences are granted. It is hardly sensible that the channels on these should use different standards. One way around this is to create a company which owns the multiplexer - as has been done in the UK for terrestrial. If not, it will mean yet another area in which STBs will multiply.

2 In building Distribution

2.1 Although most people agreed with the idea of a single frequency plan, I think that it has not been fully thought through.

As an example, if you choose the terrestrial channels always to be distributed on channels 21,23,25,27, it means that:

- all systems outside of HK/Kowloon basin will have to change frequencies
- some receivers in the basin will suffer from pre-ghosting

If you choose some other frequencies, all the buildings in the basin will have to change as well as most others. Also, again, some receivers will have pre-ghosting.

My suggestion is that there should be a number of standard frequency patterns from which the optimum could be chosen. I suggest that some work be done to look at the viability of this.

Could there be two classifications of channels ? One classification identifies a set of channels which are permitted to use either terrestrial or satellite and a second classification which IS standardised for all new channels?

This would then leave the designer the freedom to choose the best for terrestrial without destroying the wish to standardise the majority of new channels.

I have not examined this in depth but I suggest it be someone should.

2.2 I also think that the WLL Intermediate Frequency question needs more research. To limit this to 6 channels, as proposed, may limit the services offered by the WLL operator and may create a situation which makes it not a viable business. I do not have time to go into the detail of this.

Further Submission 3
By Hong Kong Cable Television Limited

1. Introduction

The "Frequency Layout Plan of IBCCDS – Result of Public Consultation" paper dated 8 June 1999 requested further comment on specific issues. Hong Kong Cable's (HKC's) response is as follows.

Before responding to the specific issues we would like to comment on a number of other issues arising from the public consultation.

2. Parallel Cable Networks

HKC is disappointed that its proposal that existing dual riser IBCCDS cable systems should be developed as parallel cable systems to increase capacity beyond the 77 channels proposed in the original consultation paper was not accepted. HKC understands why OFTA would like to give consumers free access to telecommunications and broadcasting services provided by multiple operators. However, consumers' right to buy more services from the same operator should not be sacrificed in that process. HKC believes that this dual objective could be achieved using the parallel cable solution. We are not convinced that the provision of second drop cables in those few situations where access to more than 77 channels is required is an insurmountable problem as suggested in the paper.

3. Use of "Spare" Capacity

HKC believe it is most unlikely that the 77 channel capacity will be fully utilised quickly and propose that any operator who is required to relinquish channels to other licensees should be allowed to utilise suitable "spare" channels that are not immediately required by other licensees.

4. Primary Use of IBCCDS Systems

Although HKC is keen to be allowed to use IBCCDS for delivery of telecommunication services, it recognises that the primary use of such coaxial

networks is for the delivery of television services and will be required for that purpose for the foreseeable future. Spectrum allocation should ensure that television carriage takes priority over telecommunication service delivery and that pressure on capacity from telecommunication services is met by techniques that increase bandwidth rather than curtailment of television services.

HKC is concerned that paragraph 25 of the paper suggests that 3 contiguous VHF and 3 contiguous UHF channels should be reserved for telecommunication services. This is particularly surprising considering the pressure on VHF capacity and the declared intention of OFTA of requiring HKC to relinquish VHF channels it has occupied for some years to provide television services.

5. Set Top Box Standard

HKC notes that OFTA propose to review standards for set top boxes in 2001 but we are disappointed that a more positive stance has not been taken to require licensees to work towards a standard during this period. We appreciate that standards are an international issue and that Hong Kong has little alternative but to be a follower. However, we do believe that OFTA should work will all licensees to encourage a move towards a common standard using the introduction of DTT as the pivotal means of achieving this end. HKC reiterates its view that restricting discussion of DTT issues to terrestrial commercial licensees is most unhelpful in achieving a common digital standard.

Turning to the two issues you requested further views:

6. Parallel Distribution Networks Definition of "Basic Channels" (paragraph 19 refers)

HKC agrees with the definition of "basic channels" for use with parallel distribution networks proposed in the paper; that is free-to-air terrestrial, free-to-air BSS transmitted on the 4 BSS channels assigned to Hong Kong, CCTV and radio.

7. Allocation of Frequency Band 5-50 MHz for Upstream Signalling Purposes (paragraph 21 refers)

HKC agrees that the 5-50 MHz band should be allocated to upstream telecommunications and broadcast-related signals. However, this band will need to

contain a guard band between upstream and downstream signals. Any proposal should be consistent with international cable television technology standards to ensure that Hong Kong specification conforms to equipment standards readily available from international suppliers. It is for this reason that HKC uses 5-30 MHz return path amplifiers.