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FREQUENCY LAYOUT PLAN OF IN-BUILDING COAXIAL CABLE DISTRIBUTION SYSTEMS

Result of Public Consultation

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. A total of 55 submissions were received. The list of respondents is at **Annex 1**. The original submissions can be downloaded from OFTA's website at <http://www.ofta.gov.hk/report-paper-guide/report/list-of-submissions.html>.

Comments on Specific Proposals and OFTA's Initial Responses

To adopt the 8 MHz channel plan (paragraph 25(b) of the Consultation Paper)

2. A summary of the comments on the proposal is as follows:
 - (a) AsiaSat, CTI and Star TV support the proposal.
 - (b) Galaxy is concerned that when a QPSK digital satellite signal is transmodulated to a QAM system, 8 MHz may not be sufficient to carry the signal and the resultant output signal may not fit within the 8 MHz plan for cable re-distribution.
 - (c) HKCTV agrees with this proposal that as a long-term objective the frequency plan should be based on 8 MHz channel spacing. The Hong Kong television environment is based on 8 MHz channel width. It would be unreasonable to allow a satellite service using non-Hong Kong standard transmissions to dictate future channel arrangements to the detriment of the wider community. The 6 MHz analogue transmissions will of course be replaced over time with digital services.
 - (d) HKT supports the adoption of a common channel plan with equal

frequency distribution for each channel, but does not make any submission either way on whether the 8 MHz block, or a mixture of 6 and 8 MHz blocks should be adopted.

- (e) Hutchison has no adverse comment on using 8 MHz per channel plan if it could ensure that the frequency can be efficiently used.
- (f) New T&T has no objection to the proposed 8 MHz channel plan. Flexible allocation of spectrum of less than 8 MHz should be adopted depending on the technology used and the actual service demand.
- (g) TVB is of the view that the channel plan should match with the terrestrial TV broadcasting channels. If 8 MHz channel spacing is continued for terrestrial TV, 8 MHz should also be adopted for the in-building coaxial cable distribution systems. TVB wonders if QPSK to QAM transmodulation systems are employed for digital satellite services, the resultant output signal may not fit within a 8 MHz channel.
- (h) Pacific Satellite considers that:-
 - the bandwidth can be more efficiently used if co-existence of a mixture of 6 MHz and 8 MHz channel widths is allowed;
 - only some vision carriers of NTSC-M channels match with the PAL-I channels and this creates the incompatibility to the standard NTSC-M modulator;
 - the 8 MHz NTSC channel assignment is non-standard and so it causes difficulties in tuning the TV channel; and
 - it is recommended that different TV standards should be allowed in one distribution network, and that within a specified frequency range for satellite TV distribution (e.g. 470-860 MHz) the operator has freedom to use the type of the modulators as long as the TV picture can be received by the ordinary TV set.
- (i) Sun Technology supports the adoption of 8 MHz channel plan for future installations only. This uniform change to 8 MHz should not have any retrospective effect on systems already installed. The investment to change to 8 MHz is an unnecessary and a substantial cost to system owners.

- (j) AFFC objects the proposal and is of the opinion that AFFC should not be asked to invest extra money to its system just for squeezing some spare channels for future use.
- (k) Kai Shing objects the proposal and points out that it is not to the benefit of the IBCCDS owners since the owners have to invest about HK\$10,000 per channel for channel rearrangement if the systems are now using a mixture of 6 MHz and 8 MHz channel plans. Kai Shing is of the opinion that the future telecommunication service providers should invest in the rearrangement of channel plans of the systems should they wish to provide service to the buildings which is purely a commercial activity.
- (l) Stanford Villa is of the view that the proposal is a financial burden to users.
- (m) Peridot Court is of the view that the owners should not bear the extra cost for rearranging the existing channel plans for the availability of more channels for future use.
- (n) Pacific View is of the view that the proposal is not a benefit but a burden to the IBCCDS owners.
- (o) Celeste Court is of the view that the proposal is not to the benefit of the IBCCDS owners because the owners have to invest about HK\$10,000 per channel for channel rearrangement if the systems are now using a mixture of 6 MHz and 8 MHz channel plans. It should be the future telecommunication service providers to invest in the rearrangement of channel plans of Celeste Court's system should they wish to provide services to Celeste Court that is purely a commercial activity.
- (p) Dynasty Court is of the view that the owners should not bear the extra cost for rearranging the existing channel plans for the availability of more channels for future use.

OFTA's Initial Response

3. OFTA considers that it is a common practice to use 8MHz channel for QPSK/QAM transmodulation to distribute digital television signal and no problem is expected. OFTA also considers that a mixed 6MHz/8MHz channel plan may lead to less available channels due to uneven harmonics falling into individual channels. It should be clarified that 6 MHz NTSC signals may be

distributed so long as they fall within the 8 MHz block and their vision carriers stay at the correct positions. Given the majority support, OFTA considers that the 8 MHz plan should be adopted. The frequency plan may be reviewed as and when we develop the transmission plan for the introduction of digital terrestrial television in Hong Kong.. As regards the cost of rearrangement, OFTA considers it not unreasonable for the owners of an IBCCDS to bear the cost of upgrade if they wish to receive new services. However, we agree that how the cost of the upgrade would be met should be a matter to be negotiated and agreed between the licensed operators and the owners of IBCCDS. The final decision should rest with the owners. It should be noted that existing systems will remain unchanged if no new services are required to be added and the capacity of the IBCCDS is not full.

To allocate the spare channels to licensed service providers employing spectrum efficient technologies (paragraphs 25(a) and 25(b) of the Consultation Paper)

4. A summary of the comments on the proposal to allocate the spare channels to licensed service providers employing spectrum efficient technologies is as follows:

- (a) AsiaSat, CTI, HKT, STAR TV and TVB support the proposal.
- (b) HKCTV recommends the use of parallel cable network to increase the channel capacity. There should not be a presumption that digital compression is the only solution. HKCTV is of the view that spectrum efficiency should not be the principal objective of providing digital television services in Hong Kong.
- (c) Hutchison is of the view that definite timetable should be set for all the existing service providers to eventually employ digital or other spectrally efficient technology to ensure the channel capacity can be increased.
- (d) Sun Technology is of the view that the use of the spare channels should be controlled by the system owners because they put forth the investment legitimately utilizing the allowable range. Their business opportunities will be severely restricted if deprived of such rights. Besides, channel arrangement within a building would not cause interference to systems in another building.

OFTA's Initial Response

5. With the application of digital technology, a single coaxial cable network will be capable of carrying a few hundred television programmes of standard quality. This capacity should be able to meet the demand for new and existing services. Parallel cable network will not be able to solve the capacity problem as connection to the horizontal cable will be necessary if the services were to reach individual households and if viewers were not to be forced to make a choice between services transmitted through different vertical cables. Given the majority support, OFTA considers that the proposal to allocate spare channels to licensed service employing spectrum efficient technologies should proceed. As regards whether a timetable should be set for digitizing all IBCCDSs, a review could be conducted when digital terrestrial television has been introduced.

To adopt a fixed channel plan employing adjacent channels and the preferred option (paragraph 27 of the Consultation Paper)

6. A summary of the comments on the proposal to adopt a fixed channel plan employing adjacent channels and the preferred option is as follows:

- (a) CTI, HKT and Hutchison support this proposal and prefer Option 2.
- (b) HKCTV agrees to the concept of utilizing adjacent channels but is of the opinion that the use of fixed channel plan limits the capacity of existing IBCCDS systems to 77 channels quite unnecessarily. HKCTV is concerned about the costs and operational difficulties involved in introducing a fixed plan. HKCTV considers that the sharing of costs mentioned in paragraph 51(b) of the Consultation Paper are delightfully vague. From experience it is likely that the operator responsible for initiating a change may well be required to meet the costs involved. This could lead to inequalities arising where for example the operator making use of the first adjacent channel in the UHF band could be required to meet the costs incurred in restructuring the UHF channel plan and introducing adjacent channel working, whereas users allocated "spare" VHF spectrum and the second user of UHF spectrum would effectively get a free (or at least cheap and quick) ride on the work and expenditure of others. HKCTV therefore recommends that a fixed channel plan should not be mandated and that the existing arrangement

should continue.

- (c) New T&T is of the view that OFTA should provide guideline on the precautions and prevention of interference between adjacent channel services.
- (d) Star TV supports Option 2 but is concerned that if more than 10% of TV sets suffer from adjacent channel interference, the undue inconvenience caused to the public may hamper universal usage of adjacent channels.
- (e) TVB prefers Option 1 but has reservation on using adjacent channel as stated in Option 2 (i.e. to use E31, E32, E33 and E34 for TVB and ATV as shown in Annex 12D of the Consultation Paper). Due to possible adjacent channel interference related to NICAM signal in some TV/VCR sets, adjacent channel arrangement for analogue terrestrial channels may not be technically feasible. In addition, Temple Hill transmitter provides coverage of around 50% viewers and existing IBCCDSs usually do not apply frequency conversion to these received TV signals. If Option 2 is chosen, frequency conversion for these received TV signals will be necessary. This means inconvenience and extra costs to the IBCCDS operator and/or the general public. If a fixed channel plan is employed in the IBCCDS, the future DTT channels may be required to be converted to the fixed channel plan. TVB is most concerned about possible degradation to the DTT signal after channel conversion.
- (f) Pacific Satellite is of the view that fixed off-air channel plan for all locations is not preferred. The reasons are:
 - translating 4 off-air TV channels to the designated adjacent channels requires additional cost of about HK\$32,000 for one system;
 - frequency conversion will add noise and creates spurious signals in the TV spectrum. As a result, the TV picture quality will be degraded and the spurious signals will cause interference to other TV carriers;
 - it is quite difficult to find 4 fixed channels for the off-air TV at all areas in Hong Kong without co-channel interference caused by Hong Kong's and Mainland China's TV transmitters as well as the VCRs; and
 - a standard frequency plan is good for overall management and

maintenance, however, there are a number of problems to be solved before going to this step.

- (g) AFFC is of the view that the proposal is not beneficial to AFFC or its tenants because they may need to modify their system with extra costs.
- (h) Mr. Spain is of the view that frequency changing of channels adds costs and is unnecessary if pre-ghosting does not exist. It is better to have a set of standard channel plans and the best one for a particular situation could then be chosen by the system designer.
- (i) Kai Shing is of the view that it is not to the benefit of system owners or end users. It would incur additional expenses in modifying the existing systems and installation of set-top boxes and brings financial burden to end-users.
- (j) Stanford Villa is concerned about the financial impact to those owners of IBCCDS with old television receivers.
- (k) Peridot Court is concerned it would incur additional expenses in modifying Peridot Court's existing system and installation of set-top boxes. Peridot Court considers that the owners should not bear these extra financial burdens just to squeeze some spare channels for future use.
- (l) Pacific View is of the view that it is detrimental to the interests of the system owners. The use of set-top box to avoid adjacent channel interference costs extra money to squeeze some spare channels for future use and therefore a burden to the end-users.
- (m) Celeste Court is concerned that it may need to modify its system with extra costs just to squeeze some spare channels for future use. The use of set-top box to avoid adjacent channel interference brings financial burden to the end-users.
- (n) Dynasty Court is concerned that it would incur additional expenses in modifying Dynasty Court's existing system and installation of set-top boxes. Dynasty Court considers that the owners should not bear these extra financial burdens just to squeeze some spare channels for future use.

OFTA's Initial Response

7. The majority of the submissions support the use of adjacent channels to increase the capacity of IBCCDSs but there are concerns about the adoption of a fixed channel plan because of cost implication. On balance, OFTA considers that the following proposals should be adopted :-

- (a) adjacent channel plan should be adopted in Hong Kong;
- (b) existing IBCCDSs may continue to remain unchanged if no new service is added;
- (c) when a new service is to be added to an existing IBCCDS and the capacity of the system is insufficient to handle all the services, the relevant equipment and apparatus could be upgraded to support adjacent channel operation at the frequency channels 54 – 470 MHz or 470 – 862 MHz; and
- (d) when a new licensed operator wishes to have access to an IBCCDS, it may approach the owners to reach agreement on the cost arrangement for upgrading the distribution of the four terrestrial television channels so that the IBCCDS can work on adjacent channels at any frequency channels from 470 – 862 MHz.

To fix the channel numbers for the television programmes and reserve channel numbers 1 to 4 on set-top boxes for the four terrestrial television programmes (paragraph 28 of the Consultation Paper)

8. A summary of the comments is as follows:

- (a) Galaxy, HKCTV and TVB support the proposal.
- (b) HKT believes that it is not necessary to fix the channel numbers for the four terrestrial television programmes because such a level of regulation will only serve to constrain the development and deployment of new technologies and services if they are bound to adhere to a channel numbering system which may become outdated.
- (c) New T&T is of the view that the reservation of channel numbers 1 to 4

for the four terrestrial television programmes is acceptable but not necessary. Firstly, the future digital TV broadcasting of the existing four terrestrial television programmes will inevitably use other channels. Secondly, the customer's own TV channel assignment is very dependent of individual customer need and behaviour.

- (d) Star TV points out that digital set-top boxes do not have AM/TV tuners and frequency mapping is not possible unless the four terrestrial television channels are transmitted in the digital multiplex of services from the service provider.
- (e) Sun Technology believes that the choice to set which channel number to correspond to which TV programme is a matter of personal preference. The channel order in which TV programmes are assigned should be decided by the end-users.

OFTA's Initial Response

9. There are mixed views on the proposal. OFTA considers that the current practice of setting channel number 1-4 for the four terrestrial television programmes should continue and the issue may be reviewed when digital terrestrial television has been introduced. Complaints about unequal access and unfair trading will be dealt with in accordance with the fair competition provisions in the broadcasting and telecommunications licences.

To adopt the proposed priorities for distribution in IBCCDS (paragraph 32 of the Consultation Paper)

10. A summary of the comments on the proposal to adopt the proposed priorities for distribution in IBCCDS is as follows:

- (a) AsiaSat supports the proposal and further suggests that the analogue system should be phased out with the planning date for all digital distribution systems by 2010.
- (b) CTI has no objection to the proposal. However, CTI is concerned that the channel allocation priority outlined in paragraphs 30 and 32 of the Consultation Paper would lead to unfair competition. A lot of the

scarce resources would be allocated to HKCTV because of the inefficient use of bandwidth in its analogue TV transmission. This will certainly limit the room for expansion/development by all other new operators. For this reason, they are unable to compete fairly with the dominant operator HKCTV. With the deployment of digital TV transmission, the bandwidth required by HKCTV can be reduced to one-sixth. CTI proposes that five-sixth of the HKCTV's channels should be surrendered back to the TA after a certain period to be agreed. CTI considers that digitization of its TV broadcast will not be unfair to HKCTV as all other new operators have to deploy digital TV in future as well.

- (c) HKCTV supports the proposal.
- (d) HKT supports the aims of safeguarding existing services, and prioritizing domestic and territory-wide services, subject to the comments in relation to the usage of existing spectrum by HKCTV and the benefits of requiring a migration path from analogue to digital delivery to free up spectrum to be made available to competing licensed service providers.
- (e) Hutchison is of the view that definite timetable should be set for all the existing service providers to eventually employ digital or other spectrally efficient technology. To cater for the increasing demand of frequency spectrum by telecommunication services, sufficient channels should be dedicated to cable telephony for allocation to telecommunication service providers on a proven demand basis. To use the frequency spectrum efficiently and effectively, certain conditions of use (such as the allocated frequency spectrum should be used for launching service within certain time period, let say 2 years) should be imposed and failing to comply with those conditions should result in forfeiture of the frequency spectrum.
- (f) New T&T is of the view that the existing spectrum already assigned for New T&T's cable telephony (21-25 MHz and 462-466 MHz) should also be retained for New T&T's dedicated usage, instead of only generally assigned for telecommunications services.
- (g) STAR TV supports the priorities and principles. STAR TV is of the opinion that a date, well in advance of 2005, should be set for HKCTV to convert to digital technology. The current practice of allocating 31 frequency channels, about half of the total available capacity, to HKCTV is inequitable and unfair to other players in the market. In addition, the 31 analogue HKCTV services can be transmitted on less than 6 VHF

channels in digital format. This will generate more additional capacity on existing IBCCDS than any of the other proposals.

- (h) TVB is of the view that provision should be made to reserve four additional channels in the first priority list for the simulcast of analogue and digital terrestrial television. TVB suggests that these future DTT channels should be given first priority following analogue terrestrial channels.
- (i) Sun Technology supports the proposal but of the view that the use of the spare channels should be controlled by the system owners.

OFTA's Initial Response

11. In the 1998 TV Policy Review, it was decided that cable, satellite and terrestrial broadcasters should be encouraged rather than mandated to apply digital technology in their transmissions of existing services. This policy should be maintained at this stage. However digital technique and other advanced technologies which can increase the channel capacity of the IBCCDS must be adopted for any new services. Given majority support OFTA considers that the proposal should be adopted and that the allocation of frequency spectrum for digital terrestrial television services should be given due priority.

To publish the database of IBCCDS (paragraph 33 of the Consultation Paper)

12. A summary of the comments on the proposal is as follows:

- (a) AsiaSat, CTI, Galaxy, HKT, Hutchison, Star TV and TVB support the proposal.
- (b) HKCTV is concerned that it could result in an unnecessary bureaucratic function to be undertaken by OFTA which existing licensees will be required to fund. To maintain a central database of all IBCCDS plans would require CABD and CCTV systems to be licensed with a requirement for them to submit frequency plans. Without these records any central database will not be complete. HKCTV does not see the potential benefits to justify such an arrangement and therefore do not support the proposal.
- (c) Sun Technology is of the view that the system owners should adhere to current practice of filing notifications with OFTA afterwards rather than submitting channel plan to TA for prior approval.

OFTA's Initial Response

13. Given majority support OFTA considers that the proposal should be adopted.

To use a compression ratio of 6 or more for digital transmission (paragraph 36 of the Consultation Paper)

14. A summary of the comments is as follows:

- (a) AsiaSat supports the proposal.
- (b) CTI supports the proposal with further opinion that schedule has to be developed to digitize all TV signal regardless of the type of programme service. The purposes are:
 - to allow more efficient use of the public scarce resources;

- to remove the entry barrier for new operators due to the limited scarce resources;
 - to make more choices available to the public; and
 - to improve the quality of TV broadcasting.
- (c) HKCTV is of the view that it is inappropriate for a compression standard or a minimum compression level to be set. The acceptance of this as a standard, for example, would immediately rule out the provision of HDTV services.
- (d) STAR TV supports the proposal and is of the view that it is necessary to clarify what "new services" meant in the Consultation Paper. "New services" should cover television broadcast services as well as data transmission and other telecommunications-related services. Points out that the number of HDTV services that can be compressed in a single channel may be less than the minimum requirement of six.
- (e) TVB is of the view that the compression ratio used for digital transmission should be determined by the service provider. Different types of programmes require different compression ratios to give acceptable results. The aim should be to ensure the best quality for viewers rather than to maximize the number of channels. In addition, any arrangement should take into consideration the possibility of high definition television (HDTV) broadcasting in different time segments with standard definition television (SDTV) in the same channel of the IBCCDS.
- (f) Mr. Spain does not agree to force an operator to use more compression and reduce quality.

OFTA's Initial Response

15. OFTA clarifies that the proposal refers to the capability of a system and a minimum data rate of around 20 Mbps for a 8 MHz channel should be used. The capacity could be used either for more standard quality programmes or for a smaller number of higher quality programmes. Given majority support, OFTA considers that the proposal should be adopted.

To adopt the proposed criteria for installing IF distribution system (paragraph 43 of the Consultation Paper)

16. A summary of the comments is as follows:

- (a) HKCTV supports the proposal.
- (b) STAR TV points out that the current L band distribution systems pass the entire spectrum from 950 to 2150 MHz. The requirement to block sections of spectrum will add to the complexity and cost of the installation. It will also prohibit viewers from access to certain services.
- (c) Pacific Satellite supports the proposal but with the following comments:-
 - service providers or SMATV operators should not bear all the cost for upgrading the cable distribution network. This is in fact purely a commercial decision among the parties concerned. There should not be any regulations binding such decision; and
 - IF distribution should not only be used for TV and radio signals. Telecommunication services should also be permitted.
 - Satellite receiver used for reception of free-to-air and unencrypted satellite channels should not be required to satisfy the requirements set out in paragraphs 52 to 56 of the Consultation Paper. Some satellite receivers in the market do not have RF output with filter (for adjacent channel operation) and security functions.
- (d) Sun Technology is of the view that SMATV operators/owners or viewers should not bear the cost of upgrading the system. This further cost investment does not bring about improvement in reception quality and it also deprives the rights of viewers to enjoy TV programmes at minimal cost.
- (e) Mr. Spain is of the view that IF distribution should also apply to telecommunication services

OFTA's Initial Response

17. Given no adverse comments OFTA considers that the proposal should be adopted with slight modification that IF distribution system should be allowed to distribute telecommunications services in addition to TV and radio signals.

To adopt the proposed criteria for installing parallel distribution network (paragraph 45 of the Consultation Paper)

18. A summary of the comments is as follows:
- (a) AsiaSat and HKT support the proposal.
 - (b) HKCTV supports the proposal but believes that remote switching is impractical.
 - (c) Hutchison considers that carrying basic channels in both the old and new distribution cable network will reduce the available frequency spectrum for other uses. Hutchison proposes that installation of two horizontal drop cables should be encouraged in new buildings. For old buildings, additional horizontal drop cable should be installed when the existing horizontal drop cable is pulled out for replacement.
 - (d) STAR TV is of the view that the TA should discourage the installation of parallel distribution network because it will not permit the simultaneous reception of all services by all households.
 - (e) Pacific Satellite supports the proposal with the following comments:-
 - If the new network offers optional viewing services (e.g. optional viewing of free-to-air satellite channel), then condition 45(a) of the Consultation Paper is not able to be complied. Since none of the many solutions is acceptable by Cable TV, resulting in either satellite or Cable can be selected by an end-user.
 - Only the local terrestrial TV and CCTV channels are qualified to be "basic channels".
 - The owners of the return path signals shall bear the responsibility to encrypt and protect their signals from being viewed by any third parties.
 - (f) Sun Technology concurs that cost-wise the parallel distribution network is

not a viable option. The definition of "basic channels" should be clearly defined. Prior to any official designation of "basic channels", the Government should consult the general public for more opinions.

OFTA's Initial Response

19. OFTA re-confirms the policy of access of service. But there is a need to define the "Basic Channels". OFTA considers that only free-to-air terrestrial television, free-to-air BSS transmitted on the BSS channels assigned to Hong Kong, CCTV and radio should be considered as "basic channels". OFTA wishes to seek more views on this.

To allocate the frequency band of 5-50 MHz for upstream signal purpose (paragraph 46 of the Consultation Paper)

20. A summary of the comments is as follows:

- (a) AsiaSat strongly supports the proposal while CTI and Star TV support the proposal.
- (b) HKCTV disagrees to the proposal and considers that allocating the 5-40 MHz frequency band for upstream signalling purposes would be more appropriate preserving a guard band of 10 MHz between the downstream and upstream channels. Any alternate plan would require the provision of non-standard equipment. HKCTV's existing return path uses 5-30 MHz amplifiers. An upgrade to 5-50 MHz would be costly and time consuming requiring each amplifier on the coaxial network to be upgraded.
- (c) HKT needs more information of the proposal before HKT could make meaningful comment.
- (d) Hutchison has no comment on the proposal. However, certain frequency ranges within the band of 5-50 MHz should be dedicated to telecommunication services as a whole and not to a particular telecommunication operator as set out in Annex 4A of the Consultation Paper. Allocation of the frequency ranges should be on a basis of proven demand by the service provider.

- (e) New T&T requests OFTA to confirm whether the whole 5-50 MHz spectrum can be allocated for upstream signal purpose or will there be any sub-frequency bands in the range which are restricted or reserved for other purposes.

OFTA's Initial Response

21. OFTA considers that the band 5-50 MHz should be allocated by the TA to upstream telecommunication services and broadcast-related data signals rather than left undecided. OFTA would like to seek more views on this.

To allocate the vacant frequency bands with bandwidths less than 8 MHz in 54-470 MHz for downstream signals of telecommunications services (paragraph 47 of the Consultation Paper)

22. A summary of the comments is as follows:

- (a) AsiaSat and Star TV consider that it should also apply to digital television signals.
- (b) HKCTV agrees with the proposal.
- (c) HKT supports the proposal and considers that further study is necessary on the degree of adjacent channel interference before any policy direction can be set in relation to this issue.

OFTA's Initial Response

23. OFTA considers that the proposal should be adopted with amendments that digital television services should be included and upstream signals should also be permitted.

To adopt the proposed frequency allocation plan (paragraphs 48 and 49 of the Consultation Paper)

24. A summary of the comments is as follows:

- (a) AsiaSat supports the proposal.
- (b) HKCTV supports the proposal subject to comments made elsewhere in HKCTV's submission. HKCTV agrees that the allocation of 3 channels for set-top box output should remain unchanged and that the vision carriers of 6 MHz television signals should be aligned with 8 MHz channels.
- (c) HKT supports the proposal subject to specific comments made otherwise in HKT's submission, and further subject to the following two comments:
 - the proposed frequency allocation plan for IBCCDSs should reserve adequate frequency ranges for a variety of programme broadcasting channels provided by each of the potential new pay TV licensees; and
 - the proposed frequency allocation plan should also reserve adequate frequency ranges for the proposed Local Multipoint Distribution Systems (LMDSs), which could connect to the customer premises through the IBCCDS.
- (d) New T&T is of the view that if allocation of frequency spectrum to individual service operators can be smaller than 8 MHz, co-existence of TV and telecommunications services within a single frequency channel will be possible.
- (e) STAR TV supports the proposal.
- (f) TVB has reservations on using adjacent channel for analogue terrestrial channels as proposed in Annex 12D of the Consultation Paper.
- (g) Sun Technology objects to the mandatory change to 8 MHz channel plan except for future installations.

OFTA's Initial Response

25. Given majority support OFTA considers that the plan should be adopted with an amendment that fixed channel plan will not be adopted (please see paragraph 7 of this paper). In addition to the shared use with television services, a suitable number of channels, say 3 contiguous channels in VHF band and 3 contiguous channels in UHF band, should be reserved for telecommunications services.

To adopt the proposals for upgrading IBCCDS (paragraph 50 of the Consultation Paper)

26. A summary of the comments is as follows:

- (a) AsiaSat considers that OFTA should take positive steps to encourage building owners to expand the capacity of their systems by establishing minimum carriage standards by specific date.
- (b) HKT supports the extension of the frequency range up to 827 MHz to open new frequencies for allocation within the IBCCDSs to those licensed operators employing digital or spectrally efficient technology. Requests OFTA to undertake a full and detailed study of the electromagnetic effects of allowing any service provider to utilize frequencies up to 1 GHz. Subject to the conclusion of the study, opposes the extension of the spectrum used in the IBCCDSs above 827 MHz. HKT is concerned that such extension may cause interference to mobile services operating in the GSM ranges, Hong Kong Telecom CSL's DAMPS service and Hutchison Telephone Company's CDMA service.
- (c) NWT is of the view that the band of 790-862 MHz should be considered to be allocated to upcoming technologies. For example, Wireless Local Loop. NWT considers that the use and channelisation of the spectrum from 790-862 MHz should be reserved until a more clear picture of the technology can be formulated or there is tight bandwidth requirement in the IBCCDS.
- (d) STAR TV's comments are given in previous paragraphs.

OFTA's Initial Response

27. OFTA considers that the use of spectrum within the IBCCDS will have to follow the specification on radiation limits and should not cause

interference to existing public radiocommunication services. OFTA considers the proposal should be adopted.

To adopt the proposed implementation arrangement (paragraph 51 of the Consultation Paper)

28. A summary of the comments is as follows:

- (a) CTI is of the view that the frequency spectrum is the public scarce resources and proposes to adopt the same regulatory framework for all IBCCDSs regardless of the owner and an appropriate interconnection arrangement should be developed.
- (b) HKCTV disagrees with the implementation proposal. It saves expenditure at the expense of HKCTV and is fundamentally unjust. HKCTV considers that it is more appropriate for new service operators to be required to use the parallel riser cable in existing IBCCDS and develop these risers to overcome any spectrum shortage before the services offered by existing licensees are curtailed. In its time HKCTV was required to increase the capacity of IBCCDS by providing a new riser. HKCTV does not see why new licensees should be treated differently.
- (c) HKT opposes the proposition that the regulatory treatment of a particular building's IBCCDS should depend on whether the residents of that building should want to take new services or not. It may be that the residents are not given the choice in particular buildings owned by particular developers. Also particular developers who are affiliated with telecommunications or television operators may choose not to allow the residents to seek the upgrade of the IBCCDS in their buildings to preserve incumbency advantage, or preclude new telephony competition. Any policy decisions and regulatory directions made by OFTA in relation to the IBCCDSs should be uniformly applied to all residential buildings. In addition, the administrative burden of recording the views of the residents on a building by building basis to determine which buildings should be subject to OFTA's IBCCDS frequency allocation plan would be completely disproportionate considering that consumers would not be harmed by the uniform application of the frequency allocation plan to all residential buildings.
- (d) NWT points out that the scope of "upgrading work of the IBCCDS" should be clearly defined. New service providers should not be liable

to any cost when existing services carried in the IBCCDS has not be changed according to the new allocation plan. Otherwise, it will form an uncertain cost and cost barrier to the new service provider.

- (e) STAR TV is of the view that the TA, upon request, should provide determinations on the capacity of IBCCDS and quote IBCCDS upgrade cost.
- (f) Sun Technology agrees with paragraph 51(a) of the Consultation Paper only. Paragraph 51(b) of the Consultation Paper should also apply to telecommunications services.

OFTA's Initial Response

29. Many respondents remarked that there should be no financial burden to existing residents. OFTA considers that this should best be left for the service providers to settle with the owners. If the residents of a building do not wish to have new services, there is no need to upgrade the IBCCDS and there will be no cost implication. If residents want to receive new services by the existing IBCCDS, upgrading would only be necessary when the capacity of the IBCCDS is full. OFTA agrees that the implementation proposal set out in paragraph 51(b) of the Consultation Paper should also apply to telecommunications services. OFTA considers that the proposal should be adopted.

To adopt the proposed policy and requirements for set-top boxes (paragraphs 52-56 of the Consultation Paper)

30. A summary of the comments is as follows:

- (a) AsiaSat considers that the set-top box standards are unlikely to be achieved in the next several years. AsiaSat would like to ensure that no one system precludes the customer from having a second set top box to obtain different services.
- (b) CTI supports the proposal to separate the security functions from non-security functions. As for the implementation schedule, CTI considers that three-year grace period will be an optimum for criterion (d) between the existing operator and new comers.

- (c) Galaxy supports the idea of minimizing the number of set-top boxes in general. However, Galaxy is concerned about the effect of increasing the cost of set-top boxes if the security functions are separated from the non-security functions. Believes that there is other technology such as "Simulcrypt" which can also achieve the same result of minimizing the number of set-top boxes.
- (d) HKCTV believes that a standard set-top box is viable only if DTT set-top boxes are to be compliant with it, and that it will be less important to have interoperability between the different domestic pay licensees, and domestic pay licensees and non-domestic services than between domestic pay licensees and domestic free licensees, although this should be a long term objective.
- (e) HKT gives the following comments:-
- it is not technologically feasible at this point of time to standardize a set-top box that uses both broadband twisted pair cable and coaxial cable signal inputs. Nor is it practical from the point of view of the user to require the operation of a set-top box with two types of cables carrying input signals, often sourced from different parts of the residence (the TV and telephone sockets are frequently located on different walls). Attempts at standardisation of these different technologies are uneconomical, as there is no combination set-top box available on the market;
 - given the rapid pace of technological change, any regulation of particular technology through standardisation would be a fundamental mistake as it would serve only to constrain the future development of multimedia technology due to the imposition of outdated technological standards. Standardisation of equipment that contributes to the functionality of multimedia services would stifle innovation by requiring operators to compromise system functionality in order to remain compatible with the service representing the "lowest common denominator". Regulation of this nature would also wholly diverge from the ITBB's stated policy of pursuing technology-neutral regulation appropriate to the technology-convergent environment.
 - connection to a set-top box does not appear to fall within the ambit of sections 36A, 36B and 36C of the Telecommunication Ordinance.

(f) Hutchison is of the view that the effective date for criterion (d) under paragraph 54 of the Consultation Paper should not be too long and in any event should not be more than two years after the effective date for other criteria under paragraph 54. The later the effective date for criterion (d), the greater the hindrance on the emergence of a competitive market place for set-top boxes.

(g) STAR TV gives the following comments:-

- the proposals in paragraphs 53(b), (c), (d) and (e) of the Consultation Paper are supported;
- the TA is advised not to set any specific technical requirements for set-top boxes. Proposes to review the situation on a regular basis, and to have a full industry and public consultation in 2003, by which time an applicable standard with the required functionality, and worldwide usage may have emerged; and
- the separation of non-security functions from others is neither feasible nor economically viable for the consumer. A number of security functions are closely integrated with other set-top box functions such as parental lock features, anti-taping control, piracy control, pay per view access and viewing history, access to technical diagnostic information, and account status. Any attempt to separate security from non-security functions will limit full functionality of set-top boxes, and subsequently rendering poorer services to viewers. In addition, common set-top box to carry the capability of receiving all signals is likely to be an expensive device.

(h) TVB gives the following comments:-

- if IF distribution is used in IBCCDS, the tunable range of the set-top boxes stated in paragraph 53(d) of the Consultation Paper will need to be reviewed;
- separating security functions from non-security functions will have the effect of greatly increasing the cost of the box and this cost will eventually be passed on to the viewer;
- no details are given as to whom the technical information regarding interface parameters for set-top boxes should be provided for and

what it will be used for. In most cases, this information is the property of the set-top box manufacturer/conditional access supplier and is not available for distribution by the service provider. In addition, if piracy is to be avoided, this information must be kept secure; and

- the Government needs to explore other methods of minimizing the number of set-top boxes such as Simulcrypt.

(i) Pacific Satellite gives the following comments:-

- Paragraph 52 of the Consultation Paper - Supports the idea of having a "universal standard" for set-top boxes so that a single set-top box could be used to distribute various services. Although it is not entirely possible at this stage, with the fast technology development, certain universal standard are now available and market-ready universal standard set-top boxes will likely to be available in 1-2 years time. Suggests adopting standard like Digital Video Broadcasting (DVB) standard and considering using Common Interference Standard, whereby different kind of conditional access (CA) systems used by each operators can be integrated in same set-top box and the set-top boxes can accept Smart Cards of various CA systems.
- Paragraph 53 of the Consultation Paper - Strongly supports the view of a universal standard set-top boxes to ensure fair competition and free access of services as well as to facilitate interconnection of set-top boxes. Agrees to introduce the basic requirements (a) to (e). As regards the requirement (f) to (i), suggests considering universal standard set-top box to distribute digital terrestrial television services. It is technically possible if Hong Kong decides to use DVB standard for DTT services.
- Paragraph 54 of the Consultation Paper - Agrees to adopt the proposals.
- Paragraph 55 of the Consultation Paper - Agrees with the proposed effective dates.
- A Government-Industry steering committee to steer and co-ordinate the implementation of universal standard set-top box is highly recommended.

(j) Sun Technology gives the following comments:-

- Considers this proposal to set the standards and requirements for using set-top boxes a sensitive and controversial issue that deserves further thoughts. It has significant negative effects on the general public's interests because it involves unnecessary costs to end-users.
- Since the use of set-top boxes involves many parties' interests (e.g. costs, technology uniformity, operators' service offerings, etc.), not until a mature implementation plan is devised, this is not a feasible application now.
- It is not possible to use one single set-top box for all operators at this stage.

(k) Mr. Spain proposes the following options for the assignment of the four BSS channels:-

- each channel assigned to an operator who controls all digital channels;
- all four channels assigned to one operator who controls all digital channels;
- each channel assigned to a "multiplex" operator (as with UK terrestrial practice) and digital channels licensed separately;
- all four channels assigned to one "multiplex" operator and digital channels licensed separately.

The outcome of this has a strong bearing on the set-top box issue and it is of some concern that this licensing aspect has not yet been the subject of any public consultation.

(l) Consumer Council supports the proposal and is of the view that minimum set top boxes should be required by a user to have access to all the services.

OFTA's Initial Response

31. There are no adverse comments on the proposed basic requirements in

paragraph 53 of the Consultation Paper. However the majority of the submissions do not support setting a single standard for set-top box and separating the security and non-security functions. They also do not support the proposal to require service operators to disclose the interface of their set-top boxes. Accordingly, OFTA considers that

- (a) the basic requirements as proposed in paragraph 53 of the Consultation Paper should be adopted;
- (b) a single standard for set top box, separation of security and non-security functions of set top box, disclosure of interface and other related issues should be reviewed around 2001 when the policy of DTT is finalized; and
- (c) sections 36A, 36B and 36C of Telecommunication Ordinance should apply to disputes about connection to or sharing of set-top boxes.

To adopt the proposed options for upstream signal (paragraph 57 of the Consultation Paper)

32. A summary of the comments is as follows:

- (a) AsiaSat considers that Option 2 (by using a splitter) is acceptable while Option 1 (RF switch method) is unacceptable for interactive services.
- (b) HKCTV considers that initially either option should be allowed but for the longer term Option 2 is preferred with the splitter being an active device. Proposes that this should be included in the specification if a standard box is defined for Hong Kong.
- (c) HKT considers that neither option is necessary in relation to HKT VOD's iTV set-top boxes.
- (d) Hutchison prefers Option 2.
- (e) STAR TV supports Option 2. Option 1 should be discouraged as it does not allow simultaneous reception of all services. Points out that digital set-top boxes should be continuously connected to their signal source in order to receive updated configuration and service information. For example, many digital set-top boxes receive and store information on

programme listing. Breaking the connection to the signal source stops the updating of such information and causes inconvenience to the viewer.

- (f) Pacific Satellite prefers Option 1. It is because Pacific Satellite worries about the splitter loss which would degrade the quality of the signal. Splitting loss will increase with number of services.

OFTA's Initial Response

33. OFTA clarifies that the arrangement is optional and has no preference to either option. Owners and system operators should have their choice.

Other Comments

34. Apart from inputs on specific proposals, some submissions contained more general comments on the Consultation Paper. A summary of these comments together with OFTA's initial responses are as follows.

35. AsiaSat considers that :-

(a) OFTA should mandate that:

- all new buildings plan to be completed by a certain date, say 31 December 2000, will be equipped with a fibre optic drop cable to each individual apartment or unit;
- when the existing buildings are replacing the current coaxial drop cables, they should be replaced by fibre optic cables;
- when a building is considering adding a second cable, fibre optic systems should be used; and
- access to building wiring systems should be unrestricted.

(b) The present proposal is a short-term solution only. A second section of the proposal should specify requirements for new buildings and encourage wiring replacement in older units.

36. HKCTV considers that

- (a) The Consultation Paper appears to implement a "must carry everything" policy unilaterally for IBCCDSs. Implementation of such a policy would create an artificial bottleneck by limiting current IBCCDSs to 77 channels per system. HKCTV contends that a "must carry everything" policy is unnecessary and has no legislative support.
- (b) The re-assignment of the 5 temporary channels currently used by HKCTV to other operators will mean that all the 1.6 million homes in Hong Kong will no longer be able to receive these HKCTV services.
- (c) The use of the second cable riser as a parallel cable system demonstrates quite clearly that the IBCCDS is not a bottleneck facility.
- (d) The use of the second riser in existing IBCCDSs to be both practical and economically viable. The drop cable is not a bottleneck facility because HKT's broadband network is also available to provide carriage.
- (e) The proposal to restrict HKCTV's channel assignment artificially to 31 channels has the effect of distorting competition because any new programme provider is forced to work with a competitor to gain access to viewers. The alternative would be to require HKCTV to discontinue an existing service to find room within 31 channel allocation. The proposal also conflicts with the conclusion of the 1996 Pay TV Review published on 2 July 1996 which said "there should be no limit on the number of channels which a pay TV licensee may operate".
- (f) The Consultation Paper does not comment on interconnection charging arrangements.

37. HKCTV recommends the following:-

- (a) the TA regulates to facilitate full use of the IBCCDS parallel cable riser arrangement.
- (b) there should be no requirement to carry all services on a single cable riser;
- (c) the IBCCDS should not be considered to be a bottleneck facility;

- (d) the cable drop should not be considered to be a bottleneck facility;
- (e) new licensees should be required to take all reasonable measures to utilize the full capabilities of IBCCDSs before the services offered by existing licensees are in anyway restricted;
- (f) interconnection charges should be fair and reasonable, and ensure that the provider of the network facility is not required to subsidize new operators.

38. HKT gives the following comments:-

- (a) OFTA should adopt a uniform regulatory treatment of all IBCCDSs, both in existing buildings and in new buildings.
- (b) HKT is of the opinion that the requirement of those customers' existing service providers to comply with the general regulatory framework for IBCCDSs will not cause any disruption or economic disbenefits to the residents.
- (c) Suggests that OFTA should mandate a migration path and a time-scale for each of the operators who wish to share in the use of the IBCCDSs to upgrade from analogue to digital. HKT points out that there is precedent for this approach when OFTA required each cellular operator to migrate from analogue to digital technology.
- (d) OFTA should ensure regulatory parity by assigning to each FTNS operator the same amount of spectrum which would allow each operator to compete in the provision of cable telephony services.
- (e) OFTA should reserve for future allocation further channels for competing VOD service providers who may share VOD set-top box RF output cables to televisions. HKT is concerned that OFTA appears to have accepted that HKCTV should be entitled to the vast majority of the available spectrum, at least in terms of current technology, for the foreseeable future.

39. AFFC, Kai Shing and Pacific View suggest that if the proposals put forth in the Consultation Paper are adopted, these should have no retrospective effect on all existing IBCCDSs.

40. SHK Real Estate is of the view that all costs and expenses invested in the rearrangement of channel plans should be borne by the future telecommunication service providers who wish to provide services in the building on a purely commercial decision.

41. SHK Estate Management strongly objects if there is any additional costs or imposing of new charges which will result in increase of costs to the system owners or the end-users due to changes in policy.

42. Sun Technology, Chi Fu Fa Yuen, Kai Shing (as the building manager of 27 buildings), SHK Estate Management and Tsang Lik request to extend the deadline of the consultation period.

OFTA's Initial Response

43. OFTA considers that

- (a) it is not the appropriate time to mandate any requirements in relation to the use of fibre optic cable in IBCCDSs. The technology and cost implications require a separate study. Access to networks, including building wiring systems, is covered by section 36A, 36B and 36C of the Telecommunication Ordinance;
- (b) it is the Government policy that consumers should have unimpeded access to the full range of broadcasting and telecommunications services;
- (c) the installation of a second horizontal drop cable is difficult in practice in most existing buildings and the drop cable remains a bottle-neck for the time being;
- (d) the channel arrangements for all services including HKCTV's service should follow the principles and priorities set out in paragraphs 30-32 of the Consultation Paper;
- (e) to ensure fair competition, a minimum set of channels should be allocated to each licensed service operator as far as practicable. The 5 channels

which have been assigned temporarily to HKCTV should be withdrawn and redeployed to licensed services according to the proposed priorities set out in paragraph 32 of the Consultation Paper;

- (f) the charging principles for network interconnection is beyond the scope of this consultation paper and this subject is being studied separately;
- (g) those IBCCDSs where the residents do not wish to have new services may remain unchanged and upgrading work is not required. This avoids excessive expenditure at the initial stage;
- (h) the cost for upgrading is a matter to be settled among service providers and Incorporated Owners;
- (i) nowadays most VCRs and TV sets are equipped with audio/video (A/V) inputs for connection of set-top boxes. The reservation of 3 channels for RF outputs of set-top boxes for all service providers is sufficient and further allocation is not necessary; and
- (j) an industry workshop will be organized for interested parties to further express their views having seen the views and comments of other parties and the initial responses of OFTA.

Office of the Telecommunications Authority
8 June 1999

List of Respondents

1. Eric Spain (Mr. Spain)
2. The Incorporated Owners of Pacific View (Pacific View)
3. Sun Technology Services Limited (Sun Technology)
4. The Owners' Committee of Celeste Court (Celeste Court)
5. Kai Shing Management Services Limited (Kai Shing)
(as the property management agent of Royal Ascot and on behalf of the owners)
6. Galaxy Satellite Broadcasting Limited (Galaxy)
7. Kai Shing Management Services Limited (Kai Shing)
8. Kai Shing Management Services Limited (Kai Shing)
(as the building manager of Grand Central Plaza)
9. Kai Shing Management Services Limited (Kai Shing)
(on behalf of the owners of the Le Palais)
10. Kai Shing Management Services Limited (Kai Shing)
(as the manager of Celeste Court*) see No. 4
11. Kai Shing Management Services Limited (Kai Shing)
(as the building manager of Tsuen King Garden)
12. Asia Satellite Telecommunications Company Limited (AsiaSat)
13. Kai Shing Management Services Limited (Kai Shing)
(as the building manager of Landmark North)
14. Kai Shing Management Services Limited (Kai Shing)
(as the building manager of Royal Palms and Palm Springs)
15. Kai Shing Management Services Limited (Kai Shing)
(as the property manager of East Point City)
16. Kai Shing Management Services Limited (Kai Shing)
(as the building manager of New Town Plaza III)
17. Kai Shing Management Services Limited (Kai Shing)
(as the building manager of Hillsborough Court)
18. The Owners' Committee of Dynasty Court (Dynasty Court)

Annex 1

19. Airport Freight Forwarding Centre Co. Ltd. (AFFC)
20. Stanford Villa Owners Committee (Stanford)
21. Kai Shing Management Services Limited (Greenfield Garden) (Kai Shing)
22. Sun Hung Kai Real Estate Agency Ltd. (acts for Kimose Investment Ltd, the landlord of Grand Century Place) (SHK Real Estate)
23. Kai Shing Management Services Limited (as the management company of Grand Century Place) (Kai Shing)
24. Kai Shing Management Services Limited (as the manager of King's Park Villa) (Kai Shing)
25. New T&T Hong Kong Limited (New T&T)
26. Kai Shing Management Services Limited (as the building manager of Beaulieu Peninsula) (Kai Shing)
27. Kai Shing Management Services Limited (as the building manager of Peridot Court) (Kai Shing)
28. Kai Shing Management Services Limited (as the building manager of Chelsea Heights) (Kai Shing)
29. New World Telephone Limited (New World)
30. Hutchison Communications Limited (Hutchison)
31. Kai Shing Management Services Limited (as the manager of Royal Sea Crest) (Kai Shing)
32. Kai Shing Management Services Limited (as the manager of Mayfair Gardens) (Kai Shing)
33. Kai Shing Management Services Limited (as the building manager of Villa Tiara) (Kai Shing)
34. Kai Shing Management Services Limited (as the building manager of Sea Crest Villa Phase 4) (Kai Shing)
35. Kai Shing Management Services Limited (as the building manager of Sea Crest Villa Phase 3) (Kai Shing)
36. Kai Shing Management Services Limited (as the building manager of Sea Crest Villa Phase 2) (Kai Shing)

Annex 1

37. Kai Shing Management Services Limited (Kai Shing)
(as the building manager of Sea Crest Villa Phase 1)
38. Kai Shing Management Services Limited (Kai Shing)
(as the manager of Blossom Garden)
39. Kai Shing Management Services Limited (Kai Shing)
(Port Centre)
40. SHK Real Estate Management Co. Ltd. (SHK Real Estate
(as the property manager of Hamilton Court) Management)
41. The 7th Owners' Committee of Peridot Court (Peridot Court)
42. Satellite Television Asian Region Ltd. (STAR TV)
43. Kai Shing Management Services Limited (Kai Shing)
(as the building manager of Metropolis Plaza)
44. Kai Shing Management Services Limited (Kai Shing)
(as the manager of Majestic Court, Celeste Court and 3
Repulse Bay Road)
45. Chi Fu Fa Yuen Limited (Chi Fu Fa Yuen)
(as the manager of Chi Fu Fa Yuen)
46. Tsang Lik Company Limited (Tsang Lik)
(as the manager of Pokfulam Gardens)
47. Hong Kong Cable Television Limited (HKCTV)
48. Pacific Satellite International Ltd. (Pacific Satellite)
49. Hong Kong Telecom (HKT)
50. Television Broadcasts Limited (TVB)
51. City Telecom (HK) Ltd (CTI)
52. Kai Shing Management Services Limited (Kai Shing)
(as the building manager of Hollywood Heights, 8 Deep
Water Bay Road, 51 Deep Water Bay Road, 12 Shouson Hill
Road, 37 Severn Road, Brentwood and Old Peak Mansion)
53. Kai Shing Management Services Limited (Kai Shing)
(as the management company of Metroplaza)

Annex 1

54. Sun Hung Kai Real Estate Agency Ltd. (SHK Real Estate)
(acts for Rainforce Ltd & Donora Co. Ltd, the landlords of Metroplaza)
55. Consumer Council (Consumer Council)