

HD on DTT content management proposals

BBC submission in response Ofcom's letter of 9 November 2009

1. The anticipated benefits to citizens and consumers, and to the DTT platform, of the proposed approach

The proposed Freeview HD content management approach will ensure that the platform provides consumers with free-to-air access to the best possible range of HD content.

1.1 Background – HD in the UK

- There is increasing consumer awareness of and demand for high definition (HD) content. Currently, HD broadcasts are only available in the UK on pay-TV platforms and free-to-air satellite.
- Due to capacity and technology factors, it was not previously possible to deliver HD content on the DTT platform. However, the combination of DVB-T2 technology and the MPEG-4 video encoding standard have recently enabled the development of HD services delivered via the DTT platform.
- Over the last eighteen months, the BBC and industry partners have worked together to deliver a Freeview HD portfolio comprising public service broadcaster (PSB) HD content.
- The number of HD services available to consumers has grown across platforms in the last few years. Additionally, as broadcast content production migrates from standard definition (SD) to HD, other platforms have been able to offer increasingly strong HD schedules.
- To ensure value to all consumers and the opportunity for effective competition it is vital that Freeview HD is also able to offer a wide range and choice of HD content.

1.2 The production and acquisition of high quality HD content

- The BBC and other PSBs are committed to making available a wide range of HD content through the new Freeview HD platform.
- The majority of this HD content is likely to be originated by UK production houses and/or directly commissioned by the PSBs. However, to ensure the widest possible choice of content and value for consumers, the PSBs will also acquire HD content which has been produced outside the UK.
- Inevitably, a proportion of this acquired HD content will previously only have been made available for home viewing as pre-recorded media or broadcast on pay-TV platforms. Such acquired HD content is likely to include films, drama and landmark factual material.
- The BBC and other PSBs are also likely to enter into co-production arrangements where HD content will be part-funded by programme makers and other broadcasters who will wish to broadcast this content on pay-TV platforms elsewhere.

in the world and/or obtain secondary value from sales of pre-recorded Blu-ray sales or 'paid-for' HD content downloads.

1.3 Rights-holders' concerns in relation to free-to-air broadcasting

- Rights-holders are concerned that the broadcast of their HD content in any part of the world should not devalue this content in other markets.
- BBC negotiations for the acquisition of UK broadcast rights with individual rights-holders have highlighted concerns in relation to the free-to-air broadcast of their content within the UK (currently via satellite and cable). The BBC is also aware that other PSBs have experienced similar challenges in acquiring HD content from rights-holders.
- To date, it has been possible to alleviate these concerns by making clear that the presence of content management systems on the Sky, Freesat and Virgin Media platforms ensures that HD content cannot easily be copied multiple times or uploaded to the internet.
- However, during the course of these negotiations it has been made clear to the BBC by some rights holders that they would be unable to supply certain HD content early in its release 'window' to a free-to-air platform which did not provide a content management system. In particular, for content where the rights-holders are generating appreciable revenues from Blu-ray and pay-TV rights sales, they would not want the UK broadcast of this content on the Freeview HD platform to enable widespread unsanctioned internet distribution or multiple copying of this content.
- Similarly, it is also possible that the BBC would find it more difficult to secure co-production funding for high-value HD programmes were there no controls on this content following its broadcast within the UK.

1.4 What is meant by 'content management'?

- In the context of the Freeview HD platform, 'content management' refers only to the introduction of limited controls on the copying and internet distribution of recorded HD content.
- The proposed system does not apply to standard definition broadcasts and places no restrictions on down-converted standard definition copies of HD content.
- There is absolutely no intention of using the proposed system to place any restrictions on consumers' legitimate access to and use of HD broadcasts, for example: by encrypting HD video and audio transmissions; or by limiting the period during which HD content can be viewed, or the number of times any recording can be viewed.

1.5 The technology proposed

- Over the last 18 months the broadcasting and receiver equipment industries have been working in partnership to develop a specification for the next generation of Freeview boxes which will permit the reception of free-to-air HD content. Through

this process the BBC, other PSBs and industry stakeholders who participate in the DTG have developed a solution which will deliver the strongest possible Freeview HD content portfolio to consumers, while at the same time guaranteeing that existing consumer rights to view and record content are preserved.

- At present, no existing DTT receivers are equipped to receive HD broadcasts. However, manufacturers are now in the final stages of testing HD-compatible DTT products, which are expected to become available to consumers from early 2010. Although these first-generation receivers will include content management functionality, the incorporation of these features is linked only to the use of the new Freeview HD trademark.
- These are the key features of the proposed content management system:
 - All HD video and audio content is broadcast unencrypted (free-to-air).
 - Signalling associated with each broadcaster's service identifies the level of content management associated with specific programmes.
 - Receivers respond to this signalling to ensure that appropriate content management is applied to digital outputs, copies of HD content and network interfaces.
 - Even in the most restrictive signalling state a consumer will be able to make: (i) one HD copy of content on an internal (or an associated removable) storage device; plus (ii) one HD copy on another associated and compatible storage device in the consumer's own home or on a recordable Blu-ray disc; plus (iii) unlimited SD copies of content.
- Further details of the framework for deploying the content management technology are set out in Appendix 1. Full details of the functionality available to citizens and consumers in each of the three content management states supported by the Freeview HD platform are set out in Appendix 2.

1.6 Benefits to consumers of a standardised content management solution

- The breadth of content available for consumers to watch via Freeview HD will be constrained without an appropriate degree of content management. In particular, without content management, it is unlikely that PSBs will be in a position to broadcast some acquired HD content on the Freeview HD platform. This would, clearly, be a disadvantage to consumers.
- The proposed approach ensures that a wide range of content can be made available free-to-air as early as possible following its broadcast release, including content which would otherwise only be made available on pay-TV platforms (i.e. free-to-air content availability 'windows' will be shortened). This will benefit all consumers, as they can enjoy leading-edge content without subscription or the need to purchase this content on Blu-ray, via pay-per-view or as a 'paid-for' download.
- As content management ensures the strongest possible mix of HD content, consumers have an incentive to invest in HD receivers. As the receiver market grows, the range of available devices increases, thereby increasing consumer choice and exerting a downward pressure on equipment prices.
- All consumers benefit – including those watching PSB services on satellite and cable – from consistent schedules across platforms. It would be undesirable and expensive for broadcasters to transmit different HD programming on DTT, satellite and cable

platforms, as a direct result of content management concerns relating to Freeview HD. It would also be highly inconvenient for consumers to have to navigate through different HD schedules for the same channels on different platforms.

1.7 Benefits to the DTT platform of a standardised content management solution

- Due to the rapid growth of the HD market, the development and longevity of the Freeview HD platform would be constrained without appropriate content management.
- A strong PSB HD portfolio on Freeview will encourage HD migration across the rest of the DTT platform, thereby supporting the UK broadcast industry's move to HD across all platforms.
- Implementing an appropriate content management system on Freeview HD ensures that the platform is able to compete effectively with other free-to-air and subscription HD platforms.
- Consumers will benefit from the provision of a compelling, competitive and viable alternative to the HD offerings available on other platforms, allowing them to choose the HD platform which best meets their viewing needs.

In summary, the BBC believes that consumers and Freeview HD will suffer significant detriment if the proposed content management approach is not implemented.

2. Proposal for addressing the potential disadvantages to citizens, consumers and manufacturers associated with the proposed approach

The BBC considers that any potential disadvantages to citizens, consumers and manufacturers (examined below) would be offset by the benefits to consumers, the industry and the platform.

2.1 Costs associated with implementing the proposed content management system

- Content management is, broadly, a software issue rather than a hardware issue. The chipsets used by receivers and digital recorders will have the capability to support: HDCP over HDMI output; AES or triple-DES encryption on storage devices; and DTCP over local area network interfaces.
- Receiver manufacturers have already incorporated these content management technologies into products sold across the world. This suggests that the content management-related software development costs have already been borne by receiver manufacturers, given that these content protection technologies are already deployed on platforms elsewhere. HDCP, for instance, is widely used across the world and is already embedded in every 'HD Ready' television and Virgin Media, Freesat and Sky HD device in the UK.
- As a result there are few incremental development costs for receiver manufacturers arising from the requirements of the Freeview HD proposal. Furthermore, all the technologies other than HDCP will only be required in the more advanced, high-end receivers with copying and export functionality built-in.
- The licensing costs of these various requirements are minimal when viewed as a proportion of total manufacturing costs. For example, DTCP licensing costs range from \$0.02 to \$0.10 per device (depending on volume) relative to total manufacturing and development costs in excess of \$100 per device (for a hard-disc recorder).
- It is likely that broadly the same costs will be incurred by all manufacturers of compliant receivers of a similar functionality. The content management requirement will not, therefore, change the relative position of the various manufacturers and is unlikely to affect competition.
- The proposed content management approach uses DVB-standard signalling for content management and is aligned with current European standards. While some manufacturers have expressed concern that the UK has not waited for a pan-European solution to be agreed (ideally encompassing all aspects of content management and ideally reducing their development costs) such an approach might anyway be unacceptable in the UK (for example, perhaps requiring encryption of video and audio transmissions) and would inevitably substantially delay the launch of Freeview HD services.
- The impact on consumers of any content management-related increase in receiver prices is, therefore, likely to be negligible. A flat-rate price increase in the price of all products (in this case, related to licensing) is unlikely to have a large effect on consumption as the increment is small in absolute terms, and is very small relative to the price of the product.

- More consumers will invest in Freeview HD devices if they can access a rich content mix which is identical to that available free-to-air or free-to view on other HD platforms, an outcome which can only be secured via an appropriate content management system. Manufacturers will, therefore, have more chance of higher-volume sales which, in turn, will generate economies of scale and increased turnover and, thus, offset the marginal additional development and licensing costs.
- The availability of the strongest possible Freeview HD content portfolio will create higher consumer demand for receivers, leading to more manufacturers entering the market – which benefits consumers in terms of product choice.
- Competition between manufacturers will exert downward pressure on prices – which benefits consumers in terms of value for money.

In summary, the BBC believes that any additional costs associated with the proposed content management approach will be minimal and could be fully offset by the downward pressure on prices resulting from a successful Freeview HD platform. In any case, any small increment will be significantly outweighed by the benefit to consumers of having the choice of an additional free-to-air platform offering strong HD content.

2.2 Implications for consumers' access to and use of broadcast content

Consumers' rights to access and use broadcast content will be safeguarded by the proposed operational framework for Freeview HD content management.

2.2.1. Consumers' access to and use of broadcast content under UK law

- The BBC and the industry in general are concerned to ensure that consumers' existing rights under UK copyright legislation are not negatively impacted by the content management system introduced for Freeview HD.
- The BBC notes that current UK legislation allows citizens and consumers to:
 - make a recording of a broadcast for the purpose of enabling it to be viewed at a more convenient time ('time-shifting');
 - make a copy of an audio-visual work in the course of instruction or of preparation for instruction; and
 - in the case of an educational establishment, make a recording of a broadcast for the educational purposes of that establishment, usually under the terms of the ERA licensing scheme (under which arrangements have been put in place for licensing content to educational establishments on behalf of rights owners).
- In addition, there are three exceptions which allow 'fair dealing'¹ for the purposes of:
 - non-commercial research or private study (please note that this does not currently apply to audio-visual works);
 - criticism or review; and
 - reporting current events.

¹ 'Fair dealing' allows copies to be made of a copyright work for the purposes specified in the Copyright, Designs and Patents Act 1988 (CDPA), as summarised above, provided that this use is 'fair'.

- The BBC also recognises that UK copyright legislation may evolve to reflect other reasonable uses of broadcast content by individuals and organisations.

2.2.2. Application of Freeview HD content management by broadcasters

- Under the proposed Freeview HD content management system each broadcaster will be able to signal an appropriate content management state on a programme-by-programme basis.
- As set-out in Appendix 2, the Freeview HD platform standard provides three content management states:
 - 'unrestricted' (unrestricted copying with no copy protection);
 - 'multiple copy' (unrestricted copying, other than to the internet); and
 - 'managed copy' (allows two HD copies²).
- More restrictive content management states, such as a 'copy never' state, are not supported by the Freeview HD platform.
- In respect of content broadcast on the BBC's channels, the BBC expects to signal the vast majority of HD programmes in the 'multiple copy' content management state. This is likely to be the case for almost all HD content which has been produced or commissioned by the BBC, as well as the majority of acquired and co-produced content.
- The 'managed copy' state is expected to be applied only to a small proportion of acquired or co-produced HD content which is broadcast by the BBC.
- The BBC may also choose to broadcast some HD content in the least restrictive 'free access with no encryption' state, for example where there could be educational benefit by enabling the widest possible distribution of this content. However, the signalling of this unrestricted content management state would be conditional on the BBC negotiating terms with producers, performers and other rights-holders who permitted such distribution.

2.2.3. Content management signalling – involvement of the DTLA

- Details of the framework proposed by the Digital Transmission Licensing Administrator (DTLA)³ for content management signalling on the Freeview HD platform are available for review at <http://www.dtcp.com/>. This framework was developed following extensive discussions, and it has been reviewed and accepted by the DTG as part of the HD D-Book version 6.1 (D-Book v6.1)⁴.
- Crucially for consumers, this framework limits the requirement for broadcasters to apply the 'managed copy' content management state. In summary, a content rights-holder would only be able to insist on the signalling of the 'managed copy' state for HD content which has previously only been available on a paid-for basis (e.g. via 'pay-TV' platforms, paid-for downloads or on pre-recorded Blu-ray), or for the first showing of HD content which is expected to be made available elsewhere on a paid-for basis (e.g. co-productions which have been part-funded by pay-TV operators).

² One original HD recording on a DTR (or similar) plus one additional HD copy on a media server, Blu-ray, portable media player or similar device.

³ Digital Transmission Content Protection (DTCP) technology was developed jointly by five companies (Intel, Hitachi, Panasonic, Sony and Toshiba), who formed the Digital Transmission Licensing Administrator to license the DTCP technology.

⁴ The 'D-Book', published by the Digital Television Group (DTG) sets out detailed technical standards for digital terrestrial television in the UK.

2.2.4. Impact of the proposed Freeview HD content management proposal on consumers' rights to access and use broadcast content

- The BBC would not put in place a content management approach which did not enable citizens and consumers to access and use broadcast content under either current or future legislation.
- The Freeview HD content management proposal:
 - fully respects all existing access and usage rights in respect of broadcast content;
 - is equivalent to HD content management provisions applied on other platforms; and
 - has the flexibility to accommodate future developments in copyright law.
- Critically, the proposed approach will not:
 - prevent consumers from viewing, time-shifting or flexibly sharing HD content within their own homes for their own use;
 - prevent the legitimate viewing, copying or replay of HD content for educational, criticism, review or reporting purposes;
 - apply to any existing standard definition reception and recording systems; or
 - create any restriction on the ability to make standard definition copies of content which is broadcast in an HD format.
- As detailed in Appendix 2, consumers will never be prevented from making a minimum of two digital HD format copies of all broadcast content. Consumers will also be able to make unlimited standard definition copies of all HD content.
- Educational establishments will also be able to make comprehensive use of HD broadcast content including, where necessary, making copies of broadcast content on Blu-ray or compatible networked devices (e.g. computers with DTCP-compatible client software).
- The BBC notes that were UK law to be amended so as to permit 'format-shifting', as proposed by the Gowers Review⁵, the Freeview HD content management standard already supports the transfer of digital copies of content onto other devices. Even in the most restrictive content management state, consumers are able to transfer a minimum of one additional HD copy onto other devices, including portable devices, with the only requirement being that encryption is preserved to prevent uploading of this HD content to the internet. Where a less restrictive content state is signalled, citizens and consumers will be able to make unlimited copies of HD content.

2.2.5. Ensuring that consumers understand Freeview HD content management

- The BBC acknowledges that some citizens and consumers may be concerned that the introduction of content management to the Freeview HD platform could unreasonably restrict their access and use of broadcast content.
- The BBC recognises the need to:
 - explain clearly to the public why Freeview HD content management is being introduced; and
 - assure consumers that the introduction of this technology will not restrict their legitimate access to and use of content.

⁵ The Gowers Review of Intellectual Property, published in 2006.

- The BBC also recognises the importance of reassuring consumers that no existing standard definition reception or recording equipment will be affected by the introduction of Freeview HD content management.
- The BBC intends to work with the other PSBs and with Freeview to create a 'user-friendly' guide to content management. It would be our intention that this can be widely published on all relevant websites, including those provided by the BBC, other broadcasters and Freeview. The guide could also be made available to other partner organisations (such as manufacturers and retailers), to be included in their communications.

2.2.6. Proposal to create a framework for the operation of content management

- The BBC proposes that an industry coalition could develop and implement a good practice framework – possibly in the form of a code of practice – for the operation of Freeview HD content management.
- To enable the creation of such a framework, the BBC would be prepared to facilitate discussions between broadcasters, manufacturers, relevant industry bodies (such as the DTG) and consumer groups.
- It is suggested that this framework would:
 - be clearly drafted in a 'user-friendly' way by a coalition of industry organisations;
 - include a simple explanation of content management principles and practice – for example:
 - clarifying that the Freeview HD content management system will only be applied to limit the copying and internet distribution of content rather than restricting the number of times a recording can be viewed or how long a recording can remain on a consumer's device; and
 - explaining how the BBC and other PSBs expect to apply content management signalling to their services.
 - be clearly 'owned' and supported by the industry coalition, thereby demonstrating their endorsement and their commitment to upholding the framework;
 - state how consumer queries and complaints would be addressed;
 - illustrate how the industry is also committed to self-regulation;
 - demonstrate how the implementation of Freeview HD content management will protect consumers' legitimate access to and use of content;
 - be regularly reviewed, to ensure that it reflects developments in, for example, technology, legal frameworks (e.g. copyright law) and consumers' content use (including being informed, where appropriate, by queries and complaints);
 - be widely promoted and communicated, so that consumers are aware of whom to contact if they have content management queries and complaints; and
 - provide a simple guide to the process by which consumers can submit queries or complaints, illustrating the stages through which these submissions are handled and responses provided.

2.2.7. Proposed process for handling consumer enquiries in relation to content management

- Information about the process for handling enquiries would be clearly communicated to consumers through a variety of channels, including websites provided by the BBC, other broadcasters and Freeview. The information could also be made available to

other partner organisations (such as manufacturers and retailers), to be included in their Freeview HD-related communications.

- In the event of a content management-related query, consumers would be advised to contact the broadcaster of the programme to which their query related.
- In responding to the query about a programme, the broadcaster would also steer the consumer towards other sources of information which might be useful – for example, their own guides, the CDPA, the Gowers Review or the IPO⁶.
- Any consumer who considered that their rights had been infringed by the content management signalling applied to a particular broadcast programme would be expected to address their complaint to the relevant broadcaster.
- Each broadcaster would be expected to follow the processes agreed within the suggested industry framework in responding to any complaints. It would, however, be for the individual broadcaster receiving any complaint to determine its own response, taking account of all relevant information.

In summary, the BBC believes that Freeview HD content management will not place any restrictions on consumers' legitimate access to and use of content, either now or in the future. The BBC recognises that consumers need more information about the introduction of this technology, the benefits it offers (primarily, access to the strongest possible content portfolio) and the very limited restrictions it involves. It is vital for broadcasters to reassure viewers that their existing Freeview equipment will continue to work and that consumers' rights will continue to be respected once Freeview HD content management has been implemented.

⁶ The Intellectual Property Office is the government body responsible for Intellectual Property (IP) rights in the United Kingdom. These rights include: patents, designs, trade marks and copyright.

3. Potential alternative approaches that would impact less on the receiver market, and the extent to which those alternatives would be able to deliver similar outcomes and benefits for citizens and consumers

The BBC believes that no other content management approach would deliver the same degree of consumer benefit while minimising unwanted outcomes for consumers and receiver manufacturers.

3.1. Background

- Working with other broadcasters and the wider digital television industry, the BBC has considered a range of approaches in an effort to deliver the best possible outcomes for citizens and consumers.
- Initial discussions in respect of content management for HD services on the DTT platform began in Autumn 2008, within the framework of the DTG. Over the last twelve months the BBC has engaged with ITV, C4, S4C and Five in reviewing a range of options which could potentially be applied. The BBC has also maintained extensive dialogue with a wide range of receiver manufacturers.
- Throughout this process the primary objective of all parties has been to produce significant consumer benefits through improved access to HD content on the DTT platform.

3.2. Potential approaches to Freeview HD content management

The approaches considered have included:

1. No support for HD content management.
2. A standardised approach to content management systems, where compliance with this standard would be optional (for example, linked only to the Freeview HD trademark licence).
3. A standardised approach to content management systems, where compliance with this standard would be essential (eventually selected as the best option).
4. A standardised approach to content management systems, where compliance would be mandated by regulation.
5. A standardised approach to content management systems, where compliance would be ensured through the encryption of video and audio content.
6. A functional approach to content management systems, where the behaviour of receivers would be defined but where the means of implementing content protection would be left to each receiver manufacturer.

The implications of each of these approaches – for broadcasters, receiver manufacturers and consumers – are summarised in Table 1 below.

Table 1: Comparison of potential Freeview HD content management approaches

	Approach	Description	Implications for broadcasters	Implications for receiver manufacturers	Implications for consumers
1	No content management	<ul style="list-style-type: none"> No reference to content management in standard documents. 	<ul style="list-style-type: none"> Difficult to acquire certain HD content. 	<ul style="list-style-type: none"> Nothing to implement. No cost. Less attractive platform, hence smaller market. 	<ul style="list-style-type: none"> Limited choice of HD content.
2	Standardised solution but optional implementation through the Freeview HD trademark	<ul style="list-style-type: none"> Content management solution specified in DTG D Book. Freeview HD trademark licence only available if fully implemented. 	<ul style="list-style-type: none"> Would become difficult to acquire certain HD content if non-compliant receivers enter the market. 	<ul style="list-style-type: none"> Standardised implementation. Small costs. Unequal competition between Freeview HD licensed and non compliant receivers. Less attractive platform, hence smaller market. 	<ul style="list-style-type: none"> Limited choice of HD content. Non-compliant receivers may also not provide extra functions (subtitles, audio description, etc.)
3	Standardised solution with mandatory implementation linked to access to SI data	<ul style="list-style-type: none"> Content management solution specified in DTG D-Book. Access to SI data only possible if content management implemented. 	<ul style="list-style-type: none"> A small change is needed to some DTT multiplex licences. Will enable broadcasters to acquire content which would otherwise only be available on pay-TV platforms. 	<ul style="list-style-type: none"> Standardised implementation. Small costs. Fair competition possible. Non-compliant devices very unlikely as EPG functions would be compromised. 	<ul style="list-style-type: none"> Widest possible choice of free-to-air HD content. Very few restrictions on access and use of content. Consistent receiver behaviour.
4	Standardised solution with mandatory implementation defined in regulation	<ul style="list-style-type: none"> Content management solution specified in DTG D Book. Regulation amended to require D-Book compliance for all UK devices. 	<ul style="list-style-type: none"> Would need significant changes to licences and possibly legislation. Unlikely to be able to secure Ofcom or Government support. Potential state aid concerns. 	<ul style="list-style-type: none"> Standardised implementation. Small costs. Fair competition possible. Non-compliant devices prevented. But could limit innovation in other areas. 	<ul style="list-style-type: none"> Widest possible choice of free-to-air HD content. Very few restrictions on access and use of content. Consistent receiver behaviour.
5	Standardised solution with mandatory implementation tied to encryption of video and audio	<ul style="list-style-type: none"> Content management solution specified in DTG D-Book. Encryption based on secret keys. Access to key would be conditional on D-Book compliance. 	<ul style="list-style-type: none"> Would require a significant change to multiplex and PSBs' licences. Would take a significant period of time to implement – delaying launch by 12 months. 	<ul style="list-style-type: none"> Standardised implementation. Increased costs (content protection plus encryption). Fair competition possible. Non-compliant devices prevented (unless encryption is 'cracked'). 	<ul style="list-style-type: none"> Widest possible choice of free-to-air HD content. Very few restrictions on access and use of content. Consistent receiver behaviour. More expensive receivers.
6	Functional specification with mandatory implementation (variant of options 3-5)	<ul style="list-style-type: none"> Content management behaviour specified for receivers, but implementation up to manufacturers. 	<ul style="list-style-type: none"> Might still become difficult to acquire certain HD content if some receivers do not always behave as specified. 	<ul style="list-style-type: none"> No clear standard to implement. Variable costs. No clear testing regime. Unequal competition between compliant and non-compliant receivers. Less attractive platform, hence smaller market. 	<ul style="list-style-type: none"> Limited choice of HD content. Potentially inconsistent operation, even between compliant products.

3.3. Consideration of alternative approaches to Freeview HD content management

3.3.1. Option 1 – No content management

For the reasons referred to in Section 1 of this response, without an effective content management system it is likely that the Freeview HD platform would struggle to compete with the UK's other television platforms (which already provide content management systems). The effects of such an approach would be detrimental to consumers, equipment manufacturers and broadcasters.

3.3.2. Option 2 - Standardised solution with optional implementation through the Freeview trademark

The BBC, the DTG and manufacturers have considered in detail whether satisfactory outcomes could be reached for consumers, manufacturers and broadcasters were the implementation of content management to be tied directly to the new Freeview HD trademark. While such an approach would not require regulatory intervention, the use of the Freeview HD trademark is optional for manufacturers.

If the implementation of content management were delivered only via the use of the Freeview HD trademark, a significant number of non-compliant products would enter the UK market.

A. Benefits and application the Freeview HD trademark:

- It is expected that the majority of manufacturers will want to apply to use the Freeview HD trademark licence to label and market their new DVB-T2-compliant HD receivers. The trademark will provide significant advantages in clearly and simply identifying products as being compatible with new HD services on the Freeview platform. Manufacturers are also likely to gain benefits from association with an already highly recognised brand (Freeview) and from the promotion of the Freeview HD identity within marketing campaigns and communication activities which will take place throughout 2010 (and beyond).
- For standard definition products, the use of the Freeview trademark licence is conditional on the implementation of a minimum level of functionality (as defined by the relevant sections of the DTG D-Book). However, the associated compliance checking process and other terms of the licence do not place extensive obligations on manufacturers. Broadly, any manufacturer who makes a receiver which is designed to meet this minimum level of functionality is able to use the Freeview trademark licence.
- However, in order to safeguard the reputation of the new Freeview HD brand identity, Freeview requires that HD receivers support a comprehensive set of functionality requirements. These include content management functionality, as well as a range of features which provide additional value to consumers such as sub-titling, audio-description and automatic retuning. Furthermore, Freeview has insisted that trademark-compliant receivers must incorporate Freeview branding within their Electronic Programme Guide (EPG) display. The Freeview HD trademark licence also introduces a more comprehensive compliance testing regime which requires third-party testing of the functionality and operation of new products prior to manufacturers being granted the right to use the Freeview HD trademark.

- As a shareholder in Freeview, the BBC fully supports the application of more comprehensive functionality and compliance requirements for new Freeview HD products. The BBC considers that consumers will benefit from these requirements through: (i) the development of a strong Freeview HD platform which remains competitive with other television platforms; and (ii) highly functional and reliable products.
- However, there is a risk that a significant number of receivers will not carry the Freeview HD logo and will not, therefore, be required to implement content management systems. There is clear evidence from currently available DTT receivers that a Freeview licence is not seen as necessary. There are also additional reasons why manufacturers may be even less likely to use the Freeview HD logo.

B. Availability of standard definition products which do not use the Freeview trademark:

- There are already a significant number of DTT products in use and being marketed within the UK that do not use the current Freeview trademark. Most significantly, BT Vision does not currently use the Freeview trademark on its current products. While their products are compatible with many parts of the D-Book standard, BT Vision has chosen not to incorporate full Freeview compatibility and certification. This choice does not prevent BT Vision from informing consumers that their products provide "access to Freeview channels". In practice, the only restriction is that they are unable to use the Freeview logo in their marketing or on their products and packaging. Similarly, Top Up TV did not originally use the Freeview trademark to market its products and services, although more recently Top Up TV has become a licensee of this trademark.
- In addition, there are also a significant number of low-cost receivers where manufacturers have chosen not to apply to use the Freeview trademark licence, to reduce costs associated with testing requirements and to ensure that the same product labelling can be used in other countries.
- The BBC is not aware of any research which explicitly identifies the number of DTT receivers in circulation that do not use the Freeview trademark.
- However, based on recent research carried out by GfK (and published in Ofcom's 2009 Q2 Digital Television Update) there are estimated to be a total of around 433,000 BT Vision subscribers using this service on their primary set.
- The BBC estimates that at least 3% of (the c.18 million) DTT households are currently using devices that do not use the Freeview trademark.

C. Risk that some manufacturers will not use the Freeview HD trademark:

- In addition, there are a number of reasons why the risk of a manufacturer not applying to use the Freeview HD logo is higher than for standard definition devices. Table 2 below sets out a number of factors which manufacturers are likely to assess when considering the benefits of agreeing to the terms of the Freeview HD trademark licence.

Table 2: Factors and related concerns influencing use of the Freeview HD trademark

Factor	Potential concerns
Cost of implementing comprehensive functionality requirements	Compliance with the Freeview HD trademark licence requires the incorporation of a range of new features which have been defined in D-Book v6.1 (such as: sub-titling, audio-description and automatic retuning). While these features will provide benefits to many users, their implementation will result in software development and testing costs. Given complete freedom it is unlikely that manufacturers would choose to incorporate all of these features into their products. For example, very few standard definition Freeview devices include audio-description functionality today (although this was standardised more than five years ago).
Cost of third-party compliance testing	In order to deliver a reliable and consistent consumer experience Freeview requires that all Freeview HD receivers demonstrate compliance through comprehensive third-party testing. Manufacturers who are seeking a Freeview HD trademark licence for their products have to meet the cost of this third party testing. Several manufacturers have indicated that they would much prefer a self-certification testing regime to avoid these costs.
Reluctance to include Freeview branding within on-screen EPG	More sophisticated products, including certain high-end iDTVs, already incorporate EPGs which provide access to selected additional services, such as the internet, YouTube, news and weather reports. Freeview's requirement that EPGs must carry Freeview branding creates some tensions with some of the largest manufacturers (including Sony, Panasonic and Samsung) who may wish to create their own 'portals' to a range of other services and content.
Desire to obtain competitive advantage by providing no content management controls	Given complete freedom, some manufacturers would want to avoid any costs associated with implementing content management technologies, and they would want to provide consumers totally unrestricted use of all content (including allowing unencrypted HD copies to be uploaded to the internet). These manufacturers would argue that it is the responsibility of broadcasters and rights-holders to enforce content rights through technologies such as conditional access; and that, in any case, manufacturers are not responsible for how consumers may choose to use a product.
Commitment to business models which are not fully aligned with the Freeview brand	Top Up TV and BT Vision have business models which, although dependent on access to Freeview channels, are not fully aligned with the Freeview brand. It is, therefore, possible that they will not choose to make products which meet all requirements of the Freeview HD trademark.

- The BBC has considered whether there are ways to make the terms of the Freeview HD trademark licence as attractive as possible. Although there are steps which could be taken (e.g. by convincing Freeview to make certain features optional or by allowing self-certification of compliance), each of these actions would have detrimental effects on consumers.
- Even if the majority of manufacturers' concerns could be eliminated, it is unlikely that all manufacturers would be prepared to accept the terms of the Freeview HD trademark licence. Critically, the Freeview HD trademark licence would still have to require the incorporation of content management functionality, and this factor alone could be enough to make some manufacturers refuse to accept the trademark licence terms.

D. Impact on wider market of a small number of 'non-compliant'⁷ products:

Once a small number of 'non-compliant' products become available, it is likely these would be selected by some consumers on the basis that these products would:

- be slightly cheaper than Freeview HD trademarked products (largely due to the omission of other added-value features and comprehensive compliance testing, rather than the very small savings possible in relation to the omission of content management); or
 - provide the ability to make unrestricted copies of HD content and to distribute these copies across the internet.
- Even if the absence of content management functionality were not highlighted by manufacturers when marketing these 'non-compliant' products, it is likely that a small minority of well informed and technically expert consumers would draw attention to these 'features'. By raising the profile of this unrestricted copying and internet distribution functionality it is probable that demand for 'non-compliant' products would increase, as would the propensity of some consumers to make use of these 'features'.
 - Those manufacturers who were producing content management compliant devices would be at a disadvantage in competing against 'non-compliant' products (both in terms of price and the perceived benefits of unrestricted copying). This unequal competition could cause one or more of the large volume manufacturers to remove content management functionality and Freeview HD labelling (and full compliance) from their products.

E. Impact of a significant number of 'non-compliant' products:

- Rights-holders would raise substantial objections if a significant number of UK consumers were using 'non-compliant' products to distribute HD content across the internet.
- In response, non-UK content owners and producers could:
 - increase the price of HD broadcast rights sold to PSBs – to reflect reduced income from other sources (for example 'paid-for' internet downloads or Blu-ray sales);
 - refuse to make available their most valuable content early in its release window, for free-to-air broadcast in the UK; and/or
 - reduce or cancel their investment in co-produced content.
- Depending on the health of the UK free-to-air television market, UK content rights-holders might be able force higher 'first-showing' broadcast rights charges to reflect the loss of secondary income from 'paid-for' content sales - as a direct result of widespread internet distribution of their content following transmission on the Freeview HD platform.

⁷ In this section the term 'non-compliant' is used specifically to identify products which do not incorporate content management functionality (rather than any other functionality required by the D-Book or the conditions of the Freeview HD trademark licence)

F. Implications:

- If content management is not mandatory, it is inevitable that some manufacturers will choose to produce products which enable the unrestricted copying and distribution of all HD content broadcast on the Freeview HD platform.
- While it may be possible for PSBs to convince rights-holders to ignore the availability of a small number of products which enable illegal copying and distribution, if the availability of such products were to become commonplace, rights-holders would inevitably be concerned that their content was being devalued.
- As a result PSB broadcasters will find it more difficult (or more expensive) to source HD content, with all the consequences set out above.

Overall, reliance on a trademark based approach creates a significant risk that a significant number of non-compliant set-top boxes would enter the UK market, with a negative impact for consumers and other manufacturers.

3.3.3. Options 3, 4 and 5 - Standardised solution with mandatory implementation of content management

The only way to remove the risk of non-compliant boxes in the market is to make the inclusion of content management solutions mandatory.

A. Externality and justification for the imposition of mandatory requirements:

- Consumers' purchasing decisions are generally determined by direct and personal costs and benefits. Understandably, they do not take into account the potential detriments that their purchase decisions could cause to themselves and others.
- In selecting a 'non-compliant' product consumers would be very unlikely to consider the negative effect this could have on:
 - (i) the cost of acquiring HD content; or
 - (ii) the breadth of HD content which will be available to them in the medium-term.
- In order to counter these negative effects it is appropriate to consider some form of mandated solution.
- In considering the most appropriate form for a solution, regard has been had to whether the proposed solution:
 - (i) is proportionate to the potential harm which would otherwise arise;
 - (ii) minimises any unwanted effects on citizens, consumers, manufacturers (and the wider market) and broadcasters; and
 - (iii) is no more onerous than is necessary to achieve the intended aims.

B. Proportionate response:

- As set out throughout this response, there is considerable evidence to suggest that, without a mandatory content management system, consumers will suffer as a direct result of increased content acquisition and co-production costs. This would result in a narrower choice of HD content, a weaker Freeview HD platform and weaker inter-platform competition more generally.

- The introduction of a mandatory content management system is wholly proportionate in the context of this potential harm and an environment where all other HD broadcast platforms in the UK already use content management.

C. Unwanted effects:

- Inevitably, the mandatory introduction of a content management system will create a small number of unwanted effects on citizens, consumers, manufacturers and broadcasters. However, the BBC is confident that each of these effects will be almost entirely mitigated.
- Table 3 below summarises these unwanted effects and the mitigation which will be applied to ensure the best possible outcomes for all parties.

Table 3: Summary of unwanted effects and mitigation

Affected party	Unwanted effect	Mitigation
Citizens and consumers	Very small increase in receiver prices	Stronger content will create a successful platform, hence increased competition leading to lower equipment prices
	Potential limitations to access and use of content	All existing rights protected Less restrictive than other HD platforms Highly flexible signalling, which can be modified Self-regulation by the industry
Receiver manufacturers	Very small increase in receiver costs	Stronger content will create a successful platform, hence increased sales volumes leading to greater efficiencies
	Unable to compete on the basis of unrestricted copying 'features'	
Broadcasters	Consumer concern over introduction of content management	'User-friendly' explanation of benefits
		Self-regulation and effective complaints processes.

D. Least onerous solution:

- As set-out in Table 1, mandatory compliance with a content management system could be achieved through several approaches including: linking implementation to access to SI data; requiring implementation through regulation; or requiring implementation by encrypting video and audio.
- The proposed solution only requires minor changes to the Multiplex B, C and D licences to permit the delivery of certain SI data in a compressed format.
- The BBC has elected to minimise the requirements associated with access to the Huffman 'Look-Up Tables' (which are required to make use of compressed SI data). Rather than insisting on full implementation of all functionality required by the Freeview HD trademark licence, the BBC only requires that products incorporating these 'Look-Up Tables' implement the content management functionality defined in the D-Book.
- For the reasons discussed in Section 3.3.2 of this response, the BBC is hopeful that most manufacturers will want to use the Freeview HD trademark. Nevertheless, the proposed approach ensures that manufacturers will be able to obtain full access to SI data while remaining free to choose whether or not to use the Freeview HD trademark on their products. This is an important protection

in ensuring healthy competition between products and prevents any restraint on platform operators (including BT Vision and Top Up TV) from developing HD on DTT-compatible products.

- o More significant regulatory intervention is, of course, a valid approach. However, it is unclear how consumers would benefit from changes to the regulation of the DTT platform which forced compliance with particular broadcast standards (Option 4 - Table 1) or which introduced a full CA system whereby broadcast video and audio would be encrypted (Option 5 - Table 1). Both of these approaches would require significantly greater regulatory changes than simply enabling SI compression. Consideration of these changes by Ofcom and, potentially, by Government could take many months and could effectively prevent the launch of HD services on the DTT. These approaches are, therefore, unattractive to all parties.

F. Industry consensus supporting the mandatory implementation of content management:

- o Following extensive discussions within the DTG, a majority consensus was reached among broadcasters and receiver manufacturers that a mandatory content management system would be in the best interests of all parties. Agreement was secured at the DTG Council meeting on 29 September 2009 that the standardised approach should be based on licensed access to the Huffman 'Look-up Tables' (which are required in order to make use of compressed SI data). Following further clarification in relation to specific concerns raised by a minority of manufacturers, the DTG D-Book v6.1 was published on 8 November 2009.
- o Some manufacturers have expressed concerns over the adoption of a UK-specific content management solution, and they have argued that the platform should either adopt a standardised CA approach or make do with no content management. It should be noted that these options were not considered acceptable by the majority of DTG members.

3.3.4. Option 6 - functional approach where the behaviour of receivers would be defined but where the means of implementing content protection would be left to each receiver manufacturer

Collectively, manufacturers indicated that they would much prefer a fully standardised content management system, thus ensuring a 'level playing field' for competing products. For this reason, manufacturers did not want to adopt a content management approach which only specified the behaviour of receivers and did not specify the standards which should be used.

Consumers are also likely to benefit from the use of a limited set of content management technology standards. Overall product development costs are likely to be lower, minimising consumer prices and consistent standards are expected to facilitate comprehensive and robust testing of products (at least for those products which go through the testing required to use the Freeview HD trademark) - leading to a better consumer experience.

In summary, the BBC believes that the current content management proposal is a proportionate approach which delivers the strongest possible Freeview HD content portfolio for consumers. It will deliver maximum consumer benefits while minimising unwanted outcomes for consumers – and, more generally, for receiver manufacturers and broadcasters. Implementing the proposed approach will ensure that the maximum number of manufacturers are encouraged to produce HD-compatible devices, ensuring wide consumer choice and a healthy and competitive platform.

Appendix I

A.1.1 Summary of standards used

- All content management functionality will be implemented using industry-standard technologies such as HDCP, DTCP and AACPS.
- The application and choice of these standards is defined in the DTG D-Book v6.1 (published on 8 November 2009).
- The DTG has also agreed amendments to the DTLA Encoding Rules specifically for the UK DTT transmission service, restricting rights-holders from unnecessarily insisting upon the application of the most restrictive content management state⁸.
- Agreement on the content management functionality and standards was reached with the DTG following extensive consideration of other content management options. It was the conclusion of the DTG Council that the interests of consumers and the UK digital television industry (including broadcasters, retailers and manufacturers) would best be served by the proposed content management solution.

A.1.2 Associating content management with SI compression functionality

- D Book v6.1 proposes that selected text strings in the service information (SI – which includes EPG data associated with HD services) broadcast in respect of the HD multiplex should be compressed according to a Huffman algorithm optimised for use in the transmission of digital television services. This is an important capacity-saving measure, and provides significant spectrum efficiency advantages – allowing more capacity to be reserved for programme content.
- The 'Look-Up Tables' needed to uncompress the Huffman-encoded strings were created by the BBC and are available to receiver manufacturers under a no-cost Licence Agreement from the BBC.
- The terms of this Licence Agreement require that any receiver incorporating these 'Look-Up Tables' must implement the content management functionality defined in the D-Book standard.
- In order to carry the new 'Freeview HD' brand logo under the Freeview HD trademark licence, a receiver must meet the requirements of the DTG's D-Book in full, as evidenced by successful completion of extensive interoperability tests. These tests confirm that devices can decompress SI data and implement the content management functionality defined in the D-Book.
- These licensing and testing provisions ensure that any receiver which is labelled as Freeview HD-compatible – or, indeed, any receiver which is capable of decoding and displaying EPG data associated with Freeview HD services (even where a manufacturer does not choose to obtain and use the Freeview HD trademark) must implement the agreed content management functionality.
- Together, these conditions will ensure there is little or no scope for manufacturers to produce receivers which provide unrestricted copying and internet distribution of HD content – a situation which could leave UK broadcasters unable to acquire (at reasonable cost) certain high value content and/or make it impossible for consumers to view certain content on the Freeview HD platform.

⁸ The DTLA's 'Notice of Encoding Rules of UK DTT Transmission Service' is available at <http://www.dtcp.com/>

Appendix 2

A.2.1 Summary of functionality available to citizens and consumers under each content management state (see notes below)

Content management state	Local environment (e.g. within a single household) [1]					Wider sharing [6]		
	Examples of content which could be signalled in this state	Record on DTR [2]	View on secondary display [3]	Copy to Blu-ray	Copy to secondary devices	Copy to HD PMP [4]	Copy to DVD or other SD devices [5]	Upload HD to internet
'Unrestricted copy'	<ul style="list-style-type: none"> Older PSB commissioned programmes Acquired content which has already been broadcast on US public networks 	Yes	Yes	Unlimited copies - with no encryption	Unlimited copies - encryption optional	Unlimited copies - encryption optional	Unlimited copies - with no encryption	Unrestricted
'Multiple copy'	<ul style="list-style-type: none"> UK PSB commissioned programmes 	Yes	Yes	Unlimited copies - but with encryption	Unlimited copies - but with encryption	Unlimited copies - but with encryption	Unlimited copies - with no encryption	Not permitted
'Managed copy'	<ul style="list-style-type: none"> First-run content intended for pay-TV networks First showings of acquired movies 	Yes	Yes	One additional HD format copy permitted on one other device (in addition to original DTR recording)			Unlimited copies - with no encryption	Not permitted

[1] The content management system supports the copying and distribution of HD content between a range of (compatible) devices within the home, including portable devices owned by that household.

[2] DTR = Digital Television Recorder – a device capable of receiving and recording HD content on an internal hard-disc (or associated external storage device).

[3] With a suitable home network consumers will be able to view any content stored on their DTR or Blu-ray recorder on secondary (network-connected) displays.

[4] HD PMP = HD-capable Personal Media Player – e.g. an HD-capable 'iPod'-type device.

[5] The content management system places no restriction on the copying of SD content, or on the conversion of HD content to SD for recording or distribution.

[6] The content management system makes provisions for consumers to share HD content with others, albeit with restrictions on the capability to upload encrypted HD content to the internet or the production multiple Blu-ray copies of the highest value content.

A.2.2. Terminology used in describing signalling states

The BBC notes that considerable consumer confusion has resulted from the use of the term 'encryption' in describing the content management states. It must be emphasised that encryption is only ever applied to content which is recorded on storage devices or distributed over digital interfaces. Audio and video content will always broadcast free-to-air and unencrypted. To reduce confusion, the BBC has used more clearly descriptive technology throughout this response to describe each of the technical terms used by the DTLA.

Simplified terminology	DTLA terminology
'Unrestricted copy'	'Copy freely with no encryption'
'Multiple copy'	'Copy freely with encryption', also known as 'EPN'
'Managed copy'	'Copy one generation'

A.2.3 Legal note

The signalling of content management states by broadcasters in respect of any programme does not indicate any form of entitlement to copy or distribute this content. The responsibility resides with citizens and consumers to respect all rights associated with video and audio works.

It should be noted that the content management approach implemented for Freeview HD will frequently enable far more extensive copying and distribution of broadcast content than is likely to be considered acceptable to the majority of rights-holders or is legitimate under current UK law.
