

**DTG RESPONSE TO OFCOM CONSULTATION:  
The Future of Digital Terrestrial Television  
30 January 2008**

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**EXECUTIVE SUMMARY**

DTG consider the Ofcom proposals:

- a) A necessary condition for the potential introduction of terrestrial HDTV services in the UK. We welcome the recognition that HDTV services should form part of the future Freeview service mix. However they are very far from a sufficient proposal and carry significant contingent risks which need to be ameliorated.
- b) Based on 'forward-looking' assumptions about the evolution of MPEG4 compression technology and the possible commercial evolution of the embryonic DVB-T2 standard. These should be evaluated very carefully when framing any future decisions about allocations and service mixes.
- c) Critically dependent on assumptions about the performance of DVB-T2, its timings and affordability.
- d) Need to carefully consider major structural issues such as consumer cost, coverage, choices, complexity and picture quality issues both for the current Freeview *and* the proposed HDTV or SDTV MPEG4/DVB-T2 services.

- e) Preserve existing spectral inefficiencies as there has been no serious examination of the possible migration to spectrally efficient Single Frequency Networks (SFNs.)
- f) Do not evaluate economies of scale and scope in wider European deployments of DVB-T2 versus a 'UK-only' solution. As of writing time no other EU country has made a firm commitment to the deployment of the DVB-T2 standard.
- g) Are opaque in the analysis of benefits, cost and risk. DTG would have liked to have seen a clearer analysis of these areas including explicit disclosure of the underlying assumptions used in the economic analysis.
- h) Need to perform a more comprehensive Impact Assessment which would have evaluated a range of other potential policy Options encompassing other technology choices.

We welcome Ofcom's initial proposals for a possible UK terrestrial HDTV service. However, regrettably, we do not consider that they will lead to a successful long-term FTA HD platform in the UK. They may, left unmodified, jeopardise the future universality and competitive attractiveness of the main PSB services.

DTG believe what is really needed is:

- a) A national HDTV strategy encompassing all TV platforms: cable, IPTV, satellite and terrestrial;
- b) Commitments by Government and Ofcom to provide a 5 channel PSB HDTV simulcast of BBC1, BBC2, ITV1, Channel 4, and Channel 5. This means more spectrum needs to be allocated on a **temporary** basis as part of a second switchover which is implicit in all of Ofcom's proposals;
- c) 'Lend-lease' of two additional 8 MHz UHF channels, preferably via DDR spectrum, to provide additional SFNs for national PSB and private commercial services. This provides channel critical mass and spectrum swap space to facilitate a coherent consumer crossover. Without this we do not see any realistic economic incentives for broadcasters, consumers and industry to invest in future DTT transmission technologies such as DVB-T2. A 'lend-lease' arrangement of this nature would facilitate significant spectrum recovery following a successful UK transition to DVB-T2.
- d) A commitment to MPEG4 in all future devices together with constant monitoring of its actual performance in the future prior to making any allocation decisions.

- e) A probable migration to DVB-T2 when it is commercially available, technically proven and affordable. This is unlikely before late 2010–early 2011 in DTG’s considered view.
- f) A commitment to exploiting more spectrally efficient techniques such as SFNs in the medium term.
- g) A coherently crafted proposition for UK citizens and consumers which does not jeopardise DSO, preserves the estimated £15 billion consumer investment in switchover, and which underpins the future of the UK television production industry in the face of competitive pressures. Attention must be paid to the commercial and technical stability of the current Freeview platform which is now the largest UK digital television platform, and predicted by Ofcom to have 50% market share in 2012.

## **1 Introduction**

DTG is pleased to respond to Ofcom's consultation on the future of Digital Terrestrial Television.

Ofcom has now recognised that HDTV is vitally important to the future of the television industry in the UK. It is making initial proposals for the future rollout of HD via the terrestrial platform in the UK. This follows the rollout in other OECD countries where terrestrial HDTV has been on-air for up to a decade (United States, Japan, South Korea, Australia) or is shortly to be launched (Brazil, France, New Zealand, Sweden etc).

UK developments form part of the worldwide trend to HDTV broadcasting which is now evident throughout the industrialised countries and even in countries such as Brazil, Estonia, Poland and Turkey.

HD is already available via SkyDigital to an estimated 350,000 (according to Ofcom) subscribers. This represents 20% of Sky's subscribers with HD displays, as reported by Screen Digest in 2007. Virgin Cable has also launched HD services with an estimated 190,000 subscribers according to Ofcom. Later this year IPTV networks may be able to offer HDTV services following the rollout of BT's 21CN higher speed broadband networks.

In 2007 according to DTG's supply chain group 6.0 million HD ready displays at average price points of around £600 were sold. This equates to a UK HD-ready display market of around £3.6 billion in 2007. Screen Digest predicts there will be 19.0 million HD – display HHs by 2010 and 10.5 m TVHH in the UK actually receiving HDTV services by 2012 when DSO is due to complete. GFK predicts that by 2013 there will be 35.0M HD-display TVHHs in use in the UK.

## **2 Our concerns**

DTG has a number of major strategic concerns about Ofcom's terrestrial HDTV proposals as they affect consumers, broadcasters, industry and UK competitiveness in this burgeoning UK HD television market. We have carefully considered the Ofcom proposals and the body of evidence available to DTG through our members in the broadcasting, semiconductor and electronics industries. In addition we conducted a review of public domain and confidential vendor documents, international developments, and technology trends. We have also consulted with leading players involved in the standardisation of future digital terrestrial television systems proposed for use in the UK and possibly in other EU countries.

Following this analysis it is our considered view that the Ofcom proposals do not provide a properly framed and robust roadmap to a UK terrestrial HDTV platform which will enjoy widespread consumer acceptance on a par with that likely to be realised in other advanced HDTV countries.

Our response highlights a number of major strategic concerns about the Ofcom proposals. These proposals appear to be based on 'forward-looking' assumptions about the proposed new technology, timings and take-up of the HDTV service within the context of Ofcom's envisaged spectrum and structural framework.

Other analysis has recently been undertaken by Sagentia in their report 'Advice on spectrum usage, HDTV and MPEG-4' for the BBC Trust as part of the HDTV Public Value Test which specifically evaluated the Ofcom proposals. A recent White Paper by the Intellect Consumer Electronics Council on the rollout of HD on DTT in the UK also identified some strategic concerns.

### **3 Key concerns**

The areas of concern to DTG include:

- a) Consumer aspects**
- b) Complexity of proposals**
- c) Competitiveness**
- d) Public Service Broadcasting**
- e) Private Commercial Broadcasting**
- f) Strategic questions**
- g) Technical**
- h) Timing**
- i) Universality**

The Regulatory Impact Assessment carried out by Ofcom is incomplete as a number of other serious technology and policy options have not been considered. This, in our view, would have been entirely necessary as part of a risk mitigation strategy. DTG would like this omission to be rectified during the next phase of Ofcom's analysis. We deal with this separately in our response to Question 22 of the consultation.

Each of these areas of concern is discussed in turn.

- a) Consumer aspects**

The proposals are highly complex for the consumer as new technologies are to be introduced which will only partially be adopted by the DTT platform under the Ofcom plans. A clear risk exists that a two-tier DTT technology system could emerge as there are no plans by Ofcom to mandate a total UK DTT transition to DVB-T2, the embryonic new DTT transmission standard. There are likely to be insufficient free-to-air HDTV services to drive platform takeup.

By the time DVB-T2 is commercialised in 2010-2011 in real IDTVs and STBs a plethora of HDTV channels will be offered via other platforms such as cable, Freesat, IPTV, and Sky. A 3-4 channel terrestrial HDTV service broadcast via a single multiplex offers very weak investment incentives for broadcasters, consumers and manufacturers.

Past experience has shown that advanced television systems introduced in the UK with a small channel line-up have failed e.g. BSB (5 channels, 1990), ONDigital (18 channels, 2002), and most recently BTMovio/Virgin Mobile TV (4 channels, 2007). There is an obvious risk that history could repeat itself for a fourth time with a terrestrial HDTV offer with a very limited number of channels.

We also observe that existing Freeview picture quality for PSB services including BBC, ITV, Channel 4 and Five is likely to be compromised.

DTG is concerned that these partial proposals could confuse consumer messages about UK DTT system stability in the run up to DSO. Other issues including multiple retuning of existing services as the Multiplex B conversion programme get underway in each DSO region, a potential loss of Freeview services for some viewers, and overall weakening of Freeview brand equity.

The Ofcom proposals do not provide for a 5 channel HD simulcast of the main PSB channels for the proposed spectrum allocation irrespective of whether DVB-T or DVB-T2 is used in conjunction with MPEG4.

This runs counter to the market research commissioned by Ofcom in 2007 and the earlier BBC market research conducted in parallel with the London DTT trial in 2006/2007. These both showed that viewers prefer by a considerable margin, a 5 channel PSB HD simulcast. Ofcom's policy thrust should be redirected to focus on providing spectrum inputs which deliver free-to-air PSB HD services that 74% of UK consumers want according to its own research.

In addition headroom should be provided for HD services delivered by private commercial broadcasters who have invested significantly in promoting the success of the Freeview platform. They do not wish to see the platform bifurcated between HD haves and HD have-nots.

## **b) Complexity**

The Ofcom proposals hinge on significant commercial rearrangements of the existing three PSB multiplexes and the possible transfer of commercial services to the non-PSB multiplexes currently licensed within the Freeview system. The costs involved in this process may be considerable for the broadcasting industry, and the unravelling of existing long-term carriage contracts may be problematic in law. Ofcom's analysis does not take account of the possible significant changes of economics of the DTT platform when contracts come up for renewal. Many of the channels will have to renew their carriage agreements between 2010 and 2014. Given the significant increase in transmission costs through DSO and the premiums that DTT capacity has attracted in recent years it seems possible that some channels may find the economics of staying on the platform challenging. It is possible that this could release capacity for new channels and services which can justify the carriage costs in force at that time.

Further, coverage will be lost for certain popular services affected by the move, the Freeview content proposition will be diluted for some viewers particularly in the UK Nations, and picture quality of the existing Freeview system will be compromised. A detailed breakdown of the costs to industry of these changes has not been provided by Ofcom in their analysis and the picture quality of existing PSB Freeview services may be eroded significantly by these proposals.

## **c) Competitiveness**

All other UK digital television platforms are beginning the migration to HDTV. Sky has rolled out a highly successful top-tier HDTV service in the UK, and Virgin Media has launched HDTV on its cable network. DTG understands the forthcoming Freesat FTA digital satellite service will also offer HD services from launch in spring 2008.

Following the rollout of 21CN by BT and any future nationwide FTTH network, IPTV providers such as BT, Orange, Tiscali and others may be able to offer HD services very soon.

Most advanced games systems such as PSP and X-box all provide HD outputs and it appears that a winner may be about to emerge in the HD disc player standards war. The trend towards HDTV transmission is therefore inexorable in all other platforms.

In other industrialised countries Governments and regulators either have or are taking firm steps to migrate the terrestrial platform to HD with sufficient spectrum inputs to create vibrant markets for domestic content and consumer electronics industries.

The Ofcom proposals appear to offer a low bit rate HDTV solution with each service operating at around 8 Mbit/sec compared to the current BBC/Sky satellite HD services which generally operate in the range 16-18 Mbit/sec (see [www.linowsat.de](http://www.linowsat.de)). The Sky HDTV channels are statistically multiplexed and the capacity per channel depends on the type of content broadcast. The difference in available bit rates could lead to a HD Quality of Service mismatch for PSB channels between satellite and terrestrial delivery if MPEG4 compression does not make the necessary performance gains which Ofcom aspires for it in the next four years.

Hybrid IPTV systems also use Freeview as a digital television sustaining service and would also be impacted by a low-bit rate Freeview HD service. DTG notes that a number of hybrid IPTV boxes on sale in the UK are already MPEG4 capable, use MPEG4 for push VOD services, and are able to handle HD emission formats.

The UK original content industry is dominated by the existing PSB's who will all need local HD outlets for HD produced content. UK production exported now has to be shot mainly in HD in order to gain market entry in the US, other English speaking territories and elsewhere. This particularly affects the BBC and ITV. It will be essential for them to have a full set of distribution channels for HD services in future in order to recover the costs of production across all UK platforms and deliver best value to viewers.

From a competition policy perspective a diverse array of HD delivery platforms will also serve to sustain one of Ofcom's key policy objectives in promoting platform competition.

The UK electronics industry currently comprises 10% of GDP (three times the total value of spectrum according to Ofcom's estimates in its DDR statement) and 15% of all export trade sales. It would benefit the UK industry if a native HD platform could be established in the UK operating across all digital television platforms currently used by UK citizens and consumers.

In other industrialised countries this has long been recognised e.g. in the United States, Japan, South Korea, Taiwan and elsewhere. Later this year France is to launch a seven channel terrestrial HDTV service. This will undoubtedly greatly benefit the French consumer electronics industry with France overtaking the UK in HD enabled households by 2011 according to Screen Digest forecasts (2007).

French terrestrial viewers will be able to watch the Beijing Olympics in HD this summer with suitable equipment. This emerging French competitive edge underscores the requirement for UK Government and regulatory agencies to develop a coherent consumer friendly and commercially viable plan for national HDTV services to keep pace with our EU partners.

#### **d) Public Service Broadcasting**

Market research carried out by Ofcom (2007) and separately for the BBC/ITV terrestrial HDTV trial (2006) all indicated overwhelming support for a 5 channel HD terrestrial simulcast of BBC1, BBC2, ITV1, Channel 4 and 5. This is an intuitively obvious market demand for UK consumers and citizens. It also mirrors decisions already taken in other countries such as the US, Australia, Japan, South Korea and now France where the main national channels are simulcast in HD.

DTG understands that it is cheaper for broadcasters to provide an HD simulcast of their existing SD service as they do not then have to pay for rights twice. Naturally a 5 channel terrestrial HDTV service would be carried on other digital platforms such as Freesat, Sky, Virgin and also be available to hybrid IPTV providers such as BT Vision, Orange and Tiscali. It would therefore strengthen their competitive offers and be a highly desirable outcome for UK citizens and consumers.

Such a strategy would secure the HD competitiveness of the UK PSBs, provide domestic HD outlets across all platforms, and accelerate consumer demand to make HD a mass-market proposition. Both Enders Analysis and Screen Digest are forecasting that HD will be the natural UK broadcasting transmission format by 2017 at the latest.

The PSBs have previously argued that they cannot pay for spectrum in the proposed DDR auction which Ofcom aspires to hold in 2009. Ofcom suggests that a solution to this spectrum funding gap would be direct funding of PSBs in the DDR auction by Government. This is unlikely as it would increase the overall PSBR, lead to a transfer of funds from one

Government department to another, and seems a remote possibility in the current tightened fiscal circumstances.

DTG observes that, as currently formulated, the Ofcom HD proposals do not provide sufficient spectrum resources to provide a 5 channel HD PSB simulcast at acceptable picture quality by 2012. **This observation applies whether MPEG 4 DVB-T or MPEG4 DVB-T2 is used to deliver HDTV services.**

Potentially this seriously undermines the long-term competitiveness of UK PSBs and would particularly impact the BBC as it needs to deliver its services via all available platforms. This is a serious competitive consideration as, according to Ofcom, the Freeview DTT platform is likely to secure a 50% market share by household at DSO in 2012.

#### **e) Private commercial broadcasting**

DTG has received representations from private commercial broadcasters transmitting via Freeview. They recognise the long-term trend to HDTV, have experience of HD in other world markets, and the associated competitive dynamics. Concerns have been expressed that Freeview could bifurcate between broadcasters able to broadcast in HDTV and those who would not be able to do so, due to lack of spectrum resources in that currently reserved for Freeview. A competitive outcome of this nature would seriously disadvantage this group of broadcasters. This clearly highlights the dangers of a two-tier Freeview system. DTG believes that Ofcom must address these quite legitimate concerns in its analysis of industry responses.

#### **f) Strategic questions**

Ofcom's proposals appear to be based on policy incrementalism: the need to be seen to mollify the UK HDTV lobby, the emergence of an embryonic DVB-T2 transmission standard which is not yet fully agreed at European level nor instantiated in silicon, and optimistic assumptions about the future development and performance of MPEG4 which have yet to be confirmed in real systems.

The timing of the proposals appears cosynchronous with both DSO and the proposed DDR auction and is carefully considered in this light. The three are linked: without a successful DSO, there can be no DDR auction, and nor can these Ofcom HD proposals be realised.

A danger exists that Ofcom's proposals will create consumer confusion, cause potential purchasing delays, degrade the picture quality of the

current Freeview system, devalue the HD proposition through potentially poorer picture quality and a very limited service offer, and raise serious questions about the long-term UK commitment to Freeview.

The proposals raise a number of unanswered questions which are:

- a) How can a 5 channel PSB HD simulcast be achieved?
- b) Should all existing multiplexes be converted to DVB-T2 MPEG4?
- c) Should a timetable be announced for cessation of MPEG2/DVB-T?
- d) What advice should be given about these plans as Ofcom has a statutory duty to protect the interests of citizens and consumers?
- e) What happens if the basic assumptions behind the Ofcom plan are fundamentally incorrect, uneconomic, or subject to significant implementation delay?
- f) How can the consumer electronics industry implement plans to handle this mooted technology change?
- g) What will the likely reaction of consumers be to wider public dissemination of these proposals and their impact on DSO?
- h) How can these proposals be aligned with other EU countries in order to leverage economies of scale and scope?
- i) How can proper risk management techniques be applied to these proposals?
- j) How can longer-term spectrum efficiency be achieved in the 70% of spectrum reserved for DTT by Government?

These all point to the need for a plan for a national HDTV strategy which is consumer-centric, creates significant demand, minimises implementation risk, creates significant domestic and export markets for UK industry, and secures the quality of PSB services in the UK.

It also needs to take into account the needs of private commercial broadcasters and to align with the HD plans of other platform providers such as cable, IPTV and satellite.

#### **g) Technical**

MPEG4's initial technical promise of being twice as efficient as MPEG2 has yet to be realised in real encoders operating in real time. Care should be taken when using figures from encoder manufacturer demonstrations. These are often shown using non-critical material and there are some tools which, if used, can remove the ability of current generation recorders (DTRs) to use fast forward and rewind (trick modes). For this reason they cannot always be deployed in real broadcasts.

The current BBC and BSkyB HDTV services broadcast via satellite are operating at bit rates between 16-18Mbit/sec using the 1080i emission format. These bit rates are very close to those used by the older US ATSC digital terrestrial HDTV standard, also using the 1080i emission format. The ATSC system uses MPEG2 (as used in the UK for SDTV services) and operates at a bit rate of 19.3 Mbit/sec.

Whilst it is acknowledged that 720p video compresses better than 1080i, this is only true when the source material is progressive. As most HD production for sport, music and studios is 1080i, a conversion to 720p is needed and this no longer achieves the same compression success.

MPEG4 will have to make very significant development strides in the next few years to achieve its stated performance goals and those aspired to by Ofcom. DTG is not persuaded by the claims made in the Ofcom consultant's report on the future evolution of encoding efficiency for both MPEG2 and MPEG4 systems. To base future HDTV allocation assumptions on these claims unsupported by the empirical evidence to date is in our view very unwise. Constant monitoring will be required of the progress of MPEG4 both in efficiency of encoding and cost of deployment over the next four years to provide a realistic service benchmark. This will enable informed decisions to be taken nearer the potential launch of any DVB-T2 services in the UK.

There has been a debate in the UK, mirroring that in other EU countries, about whether to employ MPEG4 DVB-T for HDTV services or wait for MPEG4 DVB-T2 to be commercially available.

Irrespective of whether DVB-T or DVB-T2 were to be used for terrestrial HDTV services the spectrum allocation and Ofcom proposals cannot adequately support a 5 channel HDTV PSB simulcast. This has strategic implications for the future consumer and commercial competitiveness of digital terrestrial television in the UK.

#### **h) Timing**

The proposed DVB-T2 standard is currently undergoing an evolving standardisation process in DVB with an anticipated completion date of April 2008, subject to agreement between the various parties in DVB.

DTG has discussed the likely timescales with DVB, individual key players in the standardisation process, semiconductor and consumer

electronics manufacturers. Many of these discussions have been confidential as they involve information relating to discussions with vendors on future product development roadmaps.

Subject to the DVB-T2 standard being agreed this spring, vendors are likely to begin chip design in spring 2008 with first designs available in silicon in 2009. DTG expects that volume shipments to consumer electronics manufacturers would begin sometime in 2010 with volume products available in retail in the period Q3 2010–Q1 2011. DTG recalls that it took three years for DVB-T to be turned from a paper standard into real receivers from 1995-1998 and it took approximately two years to develop DVB-H.

There are a number of factors to be considered in the commercialisation of DVB-T2:

- a) The need for computer simulations to validate system performance;
- b) Tests and technical trials of early silicon which may take up to a year;
- c) Qualification processes with DVB and manufacturers;
- d) Investment decisions made by vendors and consumer electronics manufacturers about T2 commercial prospects. This will depend on perceived market sizes, number of markets adopting the standard, and the number of HD services offered. Apart from the UK no other EU country has made any real commitment to deploy DVB-T2. As we have seen, the proposed UK FTA terrestrial HDTV offer is a weak offer in the number of proposed channels and in the proposed bit rates, which may adversely influence vendor investment decisions.

DTG believes it is much more likely, given the timescales, risks and commercial appraisals that DVB-T2 equipment would be widely available in late 2010 or even in early 2011.

This is up to two years later than the optimistic Ofcom estimates which, in our view, do not take account of the end-to-end standardisation process, vendor attitudes, key investment decisions which will have to be made and deployment timescales.

DTG observes that were DVB-T2 HDTV to be significantly delayed beyond 2011 that UK HDTV coverage of the summer 2012 Olympics to be held in London would be restricted to cable, satellite and, possibly, IPTV platform providers. This could place widespread domestic UK consumer access to HDTV coverage of the Olympics in some doubt.

## **i) Universality**

Digital terrestrial television will be nationwide by 2012 when DSO is scheduled to complete. According to Ofcom's analysis Freeview will hold a 50% platform share by 2012. The BBC licence fee has an implied Universal Service Obligation as the licence fee is levied nationwide. It is providing its services to all UK digital platforms in order to provide universal digital access to BBC services. If the BBC were to decide to simulcast its existing BBC1 and BBC2 services in HD, subject to suitable funding arrangements being in place, it would have to deliver this service via all platforms to provide equitable arrangements for all licence fee payers.

Commercial PSBs such as Channel 4 and ITV have begun or are planning to simulcast their existing main PSB service in HD via satellite and possibly other platforms. It is unlikely that the BBC would wish to restrict a HD simulcast of its services to some platforms because of the policy problems which would ensue.

The current Ofcom HD proposals do not technically allow a simultaneous HD simulcast of all 5 main terrestrial PSB channels, which departs from the principle of universality in both the analogue and standard definition digital world. We note that the fifth PSB, Five, is having its coverage extended from 74% in the analogue era to 98.5% in the SD DSO era. It would seem inconsistent from a UK policy perspective if, in the emerging HD era, all 5 national PSB channels were not universally available in HD. This is not possible within Ofcom's current HD proposals at least at an acceptable HD picture quality.

## 4 Summary critique of Ofcom proposals

DTG consider the Ofcom proposals:

- a) A necessary condition for the potential introduction of terrestrial HD services in the UK. We welcome the recognition that HDTV services should form part of the future Freeview service mix. However they are very far from a sufficient proposal and carry significant contingent risks which need to be ameliorated.
- b) Based on 'forward-looking' assumptions about the evolution of MPEG4 compression technology and the possible commercial evolution of the embryonic DVB-T2 standard. These should be considered carefully when framing future decisions about allocations and service mixes.
- c) Critically dependent on the performance of DVB-T2, its timings and affordability.
- d) Need to carefully consider major structural issues such as consumer cost, coverage, choices, complexity and picture quality issues both for the current Freeview *and* the proposed HDTV or SDTV MPEG4/DVB-T2 services.
- e) Preserve existing spectral inefficiencies as there has been no serious examination of the possible migration to spectrally efficient Single Frequency Networks (SFNs.)
- f) Do not evaluate economies of scale and scope in wider European deployments of DVB-T2 versus a 'UK-only' solution. As of writing time no other EU country has made a firm commitment to the deployment of the DVB-T2 standard.
- g) Are opaque in the analysis of benefits, cost and risk. DTG would have liked to have seen a clearer analysis of these areas including explicit disclosure of the underlying assumptions used in the economic analysis.
- h) Need to perform a more comprehensive Impact Assessment which would have evaluated a range of other potential policy Options

## 5 An alternative plan

DTG welcomes Ofcom's initial proposals for a UK terrestrial HDTV service. However, regrettably, we do not consider that they will lead to a successful long-term FTA HD platform in the UK. They may, if left unmodified, jeopardise the future universality of the main PSB services.

We believe what is really needed is:

- a) A national HDTV strategy encompassing all TV platforms: cable, IPTV, satellite and terrestrial;
- b) Commitments by Government and Ofcom to provide a 5 channel PSB HDTV simulcast of BBC1, BBC2, ITV1, Channel 4, and Channel 5. This means more spectrum needs to be allocated on a **temporary** basis as part of a second switchover which is implicit in all of Ofcom's proposals;
- c) 'Lend-lease' of two additional 8 MHz UHF channels, preferably via DDR spectrum, to provide additional SFNs for national PSB and private commercial services. This provides channel critical mass and spectrum swap space to facilitate a coherent consumer transition.
- d) A commitment to MPEG4 in all future devices together with constant monitoring of its actual performance in the future prior to making any allocation decisions.
- e) A probable migration to DVB-T2 when it is commercially available, technically proven and affordable. This is unlikely before late 2010–early 2011 in DTG's considered view.
- f) A commitment to exploiting more spectrally efficient techniques such as SFNs in the medium term.
- g) A coherently crafted proposition for UK citizens and consumers which does not jeopardise DSO, preserves the estimated £15 billion consumer investment in switchover, and which underpins the future of the UK television production industry in the face of competitive pressures. Attention must be paid to the commercial and technical stability of the current Freeview platform which is now the largest UK digital television platform.

We look forward to discussing our alternative proposals with Ofcom. In Appendix 1 we answer questions in the consultation which DTG feels it is appropriate to respond to.

# Consultation questions

*Question 1: which services are most likely to drive take up of DTT consumer reception equipment using new technologies? In particular, are HD services the most likely to do so?*

Consumers are spending billions on DTT products and particularly large panel HD Ready displays with integrated DTT. Over 6m have been sold to the end of 2007 at an estimated value of £3.6 billion. The projected ownership in 2012 is forecast to be 35m. Acceptable screen sizes are growing, with one manufacturer quoting 65 inch screens as a norm in a few years. SD pictures do not have the resolution to provide satisfactory viewing on large screens in average size rooms. The public sees the start of HD services as the natural evolution of television. As black and white turned to colour, consumers expect HD to follow SD and believe they are preparing themselves for the future. HD will quickly move from a "new technology" to being the expected norm and anything less will be substandard quality. Of course consumers will also want more channels and local channels but they are already investing in HD capable equipment and DTT will be expected to deliver a comparable quality to other sources. If suitable provision of spectrum that will be sufficient for substantial HD on DTT is not made now, there is a serious risk that DTT services will move from being the UK's most watched programmes to become a sideshow. This would be a serious market failure which has not been materially considered in Ofcom's analysis.

DTG notes that pay-TV services from Setanta and Top-Up TV have also driven the takeup of DTT consumer reception in the existing MPEG2 domain. The BT Vision hybrid IPTV/Freeview box provides a push VOD service via MPEG4 and the existing Freeview services via MPEG2. Sky has announced plans for a Picnic SD MPEG4 mini-pay package which is currently the subject of another Ofcom consultation. All of these existing or planned pay-TV services depend on access to existing Freeview spectrum, currently in the 70% reserved for DTT services. We also note that subscription HDTV services could be launched by successful bidders in the proposed DDR auction using a DTT technology of their choice as the auction is planned to be technology and service neutral.

*Question 2: do you agree with Ofcom's assessment that it would be beneficial for the DTT platform to begin to upgrade to new technologies – DVB-T2 and MPEG-4 - to make more efficient use of spectrum and to allow for the introduction of new services?*

DVB-T2 and MPEG-4 will clearly improve the efficiency over DVB-T and MPEG-2 but the actual benefits are yet to be proven. Clearly a migration path is needed for DTT to evolve and grow to facilitate HD, surround audio and more advanced interactivity. Due to the massive uptake of DTT equipment leading up to DSO it is important for the market to adopt these new technologies as soon as possible to

reduce the number of legacy receivers sold. It is also important to get actual transmissions on air as soon as possible to encourage manufacturers to make the investment in their equipment. Additional spectrum should be used in the short term to provide this intermediate service and introduce MPEG4 and DVB-T2 to a substantial market, such as the successful PSB HD trial in 2006/7. The most important aspect of DVB-T2 is that it offers much better SFN options than the existing DVB-T system which makes it much more spectrally efficient in the longer term.

*Question 3: Ofcom is particularly interested in hearing from multiplex operators and programme providers as to whether they are interested in using DVB-T2 and / or MPEG-4, and whether Ofcom should consider permitting their use on DTT?*

The DTG has updated its D-Book specification for MPEG-4 SD and HD services and will also incorporate DVB-T2 as soon as the specification is finalised. This will provide the interoperability document for both multiplex operators and manufacturers to work to and ensure the market remains as compliant and successful as the current UK DTT network, depending on which future standards are eventually authorised and deployed.

*Question 4: do you agree that the earliest possible availability and adoption of the technologies is in the interests of consumers and citizens?*

- It will allow competitive HD services to be introduced at the earliest opportunity
- It will limit the sale of legacy equipment thus preventing the acquisition of what will become obsolete equipment
- It will provide HD programming in sustaining services required for the successful introduction of new systems such as IP distribution.
- It will contribute to the overall economic wealth of the nation by ensuring a UK HD programme supply to international markets. This will result in both economic and cultural gains.

*Question 5: do you agree with Ofcom's view that DVB-T2 MPEG-4 reception equipment could be commercially available in time for DSO in Granada region in late 2009?*

The manufacturing membership of the DTG has varying opinions as to the timing of DVB-T2 equipment, due to the fact that the specification is not agreed until April 2008. Indications are that silicon and early settop boxes could be available in by autumn 2010 or later. Integrated displays will more likely be in 2010/2011 but there may be an upgrade solution for such displays with MPEG-4 decoding. A module could be created to fit into the CI slot, mandatory in IDTVs over 30cm, which could receive the DVB-T2 signal and provide a compatible transport stream into the product. DTG is currently investigating this possibility.

*Question 6: do you agree that some form of intervention is required in order for the DTT platform to commence an upgrade to new technologies without delay?*

The main intervention needed is in the provision of spectrum to allow the introduction of much more efficient spectrum use, which will ensure that the DTT platform is fit for purpose and also produce a more satisfactory dividend for other uses, some of which may be available at DSO. Ofcom's proposals do not provide sufficient headroom for a coherent consumer crossover to spectrally efficient technologies such as DVB-T2.

*Question 7: Do you have any proposals for launching MPEG-4 services on a DTT multiplex using DVB-T in advance of the proposed 2009 timetable and if so can you provide details of how such a service would not undermine the proposed MPEG-4/DVB-T2 launch in 2009?*

Individual DTG members are either proposing to launch MPEG4 SDTV services e.g. Sky or are advocating the use of MPEG4 for HDTV services and are proposing to use the existing DVB-T standard. These deployments depend on securing the necessary approvals from Ofcom and access to spectrum.

*Question 8: do you agree with Ofcom's proposed approach for adding SD and HD versions of MPEG-4 and DVB-T2 profiles to the list of permitted standards for*

*DTT in the spring, and that Ofcom's consent must be sought prior to adoption of these standards?*

The D-Book will already cover the interoperability requirements and as soon as they can be permitted in the OFCOM licences, a trial service could be put on air to encourage manufacturers to create products.

*Question 9: do you agree with Ofcom's proposal that Multiplex B should be cleared and upgraded to new technologies?*

If agreement can be reached by the PSBs to achieve the reorganisation then it will allow a DVB-T2 multiplex to be created which will start to help the DTT platform develop. However, the complexity of making these changes during the DSO process should not be taken lightly. Additional changes will require additional re-tuning in products and could confuse the pre/post DSO information. Also, one multiplex will allow the start of a few HD services but will not allow for the development and migration of other channels which would need additional capacity initially to progress.

*Question 10: do you agree with Ofcom's proposal that all multiplexes should be required to upgrade to 64QAM at DSO in order to make the most efficient use of spectrum (i.e. that the mode change should not merely be optional)?*

Headroom is needed to allow a migration of services from SD DVB-T to HD DVB-T2 multiplexes. It should be remembered that not all the "mode change capacity" has the same UK coverage. Half of the capacity currently has only 74 % population coverage and this will only be expanded to 90% population coverage at DSO.

*Question 11: do you agree with our proposals for accommodating Five, S4C, TG4 and GDS on Multiplex 2?*

Ofcom should carry out real-time tests in conjunction with the affected broadcasters to assess the impact of the proposals on picture quality and consumer acceptance.

*Question 12: do you agree with our assessment that nine SD services can operate on Multiplex 2? If not, do you have an alternative proposal?*

We have serious concerns about the impact on picture quality that such a move will bring. Due to the increasing uptake in MPEG-4, very little development is being put into MPEG-2 encoders so we do not see any significant MPEG-2 improvements happening in the future. We would like to see a demonstration of the picture quality achieved by real equipment, using a realistic selection of material including children's content and sport, decoded and displayed on a modern flat panel display. It is our belief that such a demonstrator with nine SD services in 24Mbps would show a video quality that would, in all likelihood, be unacceptable to the majority of viewers.

*Question 13: do you agree with our proposals for the reorganisation process for the existing multiplex services set out in the central case scenario?*

This is a matter for the UK PSBs to agree.

*Question 14: do you agree with the principles / conditions that Ofcom proposes to use to evaluate counterproposals for the reorganisation process?*

To ensure that the proposals achieve an acceptable quality of service on the DTT platform, a realistic demonstration of the proposal should be observed by key members. Otherwise, if quality of DTT is compromised, the viability of DSO will also be compromised. This will have very serious implications for the stability of the DTT platform, consumer acceptability and confidence in DSO.

*Question 15: Do you have an alternative proposal for the reorganisation process? If yes, please provide details.*

We have no alternatives pre-DSO but are working on a plan for the longer term post-DSO which we will share with OFCOM in due course.

*Question 16: do you agree with Ofcom's assessment of the options for allocating the upgraded capacity?*

This should be a matter for Government to determine.

*Question 17: do you agree with the proposal that HD broadcasting on the DTT platform should use the more efficient progressive format, rather than the interlaced format?*

Yes. Interlace is an old compression system that has been superseded by modern techniques. Compression of a progressive source is more efficient than interlace due to the increased simplicity of motion prediction. However, often a progressive 25 Hz picture is carried within a 1080i25 signal, so called progressive segmented frame (psf). Natural history and dramas are often shot in 1080p25 due to the film like appearance and so 1080p25 can easily be carried within a 1080i25 signal if handled correctly. We are starting to see equipment which operates at the 1080p50 standard which is superior in terms of resolution, motion portrayal and compressibility. The EBU undertook a study which showed that for the same bitrate, 1080p50 produced a higher quality picture than 1080i25 or 720p50. While 720p50 was the preferred progressive standard a few years ago, it does not carry the resolution of modern displays and as such gives a lower quality image to 1080p50. Silicon capable of decoding 1080p50 MPEG-4 has already been created and manufacturers should be encouraged to support this resolution in products for future compatibility.

*Question 18: do you agree with the proposal that Ofcom should not mandate the use of the capacity for any particular service type (SD or HD) but allow the broadcasters to make proposals?*

No comment

*Question 19: do you agree with the proposal that the capacity should be allocated in three UK-wide blocks initially, rising to four blocks at DSO?*

It has yet to be proved that sufficient quality can be achieved with video, audio and ancillary services within 10 Mbps MPEG-4 and so it would be unwise for OFCOM to allocate capacity within a multiplex. There is a very good reason that the BBC HD service currently runs at 16Mbps and that the Sky HD services are running around 18Mbps. Sky's HDTV services are statistically multiplexed and the capacity per channel varies depending on the type of content broadcast. The success of BSkyB's HD growth confirms that the high bit rate produces success. This can be contrasted with the lower bit rate HDTV services offered by mainland European satellite pay-TV providers which have not enjoyed anywhere near the success of BSkyB's HDTV offer. (See <http://www.linowsat.de/hdtv/hdtv/hdtv.shtml> for further details of UK and European satellite HDTV bit rates in use.) HD's USP is its picture quality and an ordinary quality picture at reduced bit rate may well reduce this success. TV is an entertainment medium, not a telecom product. This is what is currently required to achieve the quality of HD, particularly with sport and demanding content. It would be better for OFCOM to licence services and allow the multiplex operators to allocate capacity. Once capacity is available, additional services can be licensed.

*Question 20: do you agree with the proposed criteria for the comparative selection process?*

High picture and sound quality is essential for high definition services. It is not sufficient to simply provide a particular number of lines of pixels as can be seen by viewing some of the so-called "HD programmes" currently on the internet. There should be no sub-standard pictures in such a small service.

*Question 21: do you have any comments on Ofcom's proposals for the upgraded multiplex?*

In our opinion, 10 Mbps is not enough to encode an HD service without compromising the quality. Until it can be proven to work, additional capacity and contingency is required to start a successful HD offering of services.

*Question 22: Do you agree with Ofcom's impact assessment?*

No. The Regulatory Impact Assessment is incomplete. The RIA should have covered a much wider range of Options than the narrow focus on DVB-T2 and upgrading a single multiplex. Specifically Ofcom should have considered and analysed the following policy options:

Option 1: 'Do nothing'

Option 2: 'Ofcom plan' as per the document

Option 3: 'Ofcom Plan + additional spectrum' to drive services (e.g. with either a proposed seventh MFN or two SFNs based on a spectrally efficient 2 x 8MHz pair using 'lend-lease' spectrum from the DDR.)

Option 4: Alternatives to Options 2 and 3 but using DVB-T rather than DVB-T2 as proposed by others.

#### Option 5: Alternative plans

This analysis has not been completed and in our view the costs and benefits to broadcasters, consumers and citizens have not been properly appraised. As part of its statutory duties Ofcom is required to carry out a comprehensive RIA. This omission should be rectified in Ofcom's next phase of analysis.

*Question 23: Do you agree with Ofcom's assessment of the potential benefits, risks and mitigations strategies relating to the impact of these proposals on the DSO programme?*

No. The analysis is incomplete as discussed in the response to Question 22.