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Background

I have no professional connection with the radio industry and work as a research scientist. I run a radio website, Frequency Finder (http://mysite.wanadoo-members.co.uk/freq_find/index.html) as a hobby. I am commenting, mostly on technical issues, from the perspective of the 'citizen/consumer'.

Replacement of FM radio

The phasing out of FM radio in favour of a system which is inferior in terms of both sound quality and coverage would be unacceptable and would be a sign of contempt for the ordinary radio listening public.

It is a matter of fact that the sound quality of every UK DAB station, except Radio 3, is inferior to that available from FM under good reception conditions. This is obvious to anyone with normal hearing listening on head phones or an inexpensive hi-fi; you don't have to be a Hi-Fi News reading obsessive to notice the difference.

Surveys reporting 80-90% satisfaction with DAB sound quality (I don't recall the exact figures) merely reflect the fact that the vast majority of DAB listening is done on portables with relatively poor speakers. Clearly, a large proportion of those listeners not using portables are unsatisfied with the sound quality. If the surveys had bothered to break down DAB listeners by type of radio, I'm sure the dissatisfaction of those listeners not using portables would be clear for all to see. Those surveys also show that about 40% of people cite better sound quality as a reason for buying a DAB radio; these people are being cheated.

No single FM transmitter should be switched off until equivalent or better sound quality is available to mobile listeners via DAB or another digital radio system. I believe the solution is to upgrade the UK DAB system to use the AAC+ coding standard as many other countries will be doing as early as next year (see below).

Moving on to coverage, there is currently a problem with indoor DAB reception that Ofcom is working to resolve. Once this has been fixed, commercial radio DAB coverage should be roughly equivalent to that of FM. However, the coverage of the BBC's FM networks is quoted at 98%, with most of the rest of the population receiving a poor service. The number of people receiving no service at all is tiny. As a public service, the BBC must provide universal coverage. Providing even 98% coverage on DAB is unlikely to be cost-effective for a very long time. Digital radio does not provide marginal reception, so to ensure that no-one loses a service

through the switching off of FM, the coverage would have to reach the order of 99.9%; almost certainly impractical.

Thus, to meet its universal coverage obligations, the BBC will need to retain its FM networks for the foreseeable future. However, providing supplemental coverage to DAB could be done with much fewer transmitters than are used at the moment. Only, the main high power transmitters and the transmitters covering areas un-served by DAB would have to be retained. Retaining FM is likely to be cheaper than investing in a new DRM network to supplement DAB.

Upgrading the DAB system

The DAB standard has recently been upgraded to incorporate the AAC+ coding standard and more efficient error correction. This new DAB standard is 2-3 times more efficient than the current system. However, current receivers are not compatible with it. A large number of countries are adopting this standard next year. Thus, by 2012 (when analogue TV ends), the vast majority of UK DAB receivers will be compatible with the new standard.

Switching to the new standard in the UK would enable sound quality to be improved, capacity to be increased and transmission costs per service to be cut. The argument for switching is overwhelming. However, there are three issues that require the intervention of the regulator to protect consumers. These are:

- 1) Ensuring that current DAB radios that are not compatible with the new standard have a reasonable lifetime;
- 2) Ensuring that sound quality is improved by the transition to the new standard;
- 3) Ensure that receiver manufacturers adopt the new standard as quickly as possible and don't dump obsolescent DAB radios on the UK market while selling new standard receivers elsewhere.

To protect users of existing DAB radios, Ofcom must introduce a timetable for phasing in the new DAB standard over a period of five years or so. A plan is required that prevents listeners on existing radios from losing services, while still providing an incentive to switch. The fact that DAB multiplexes may transmit a mixture of old and new standard radio stations should be exploited to smooth the switchover. I propose a three phase transition:

Year 0) Multiplex operators should be free to use their 30% data allocation for AAC+ radio services. Spare capacity and capacity freed up by stations closing could be used, but existing stations should not be switched from the old MP2 standard to AAC+.

Year 3) Multiplex operators should be permitted to switch FM-simulcast services over to AAC+ and use the capacity freed for new stations. This would avoid disenfranchising listeners on legacy DAB radios as virtually all of these radios have FM, on which the stations concerned would still be available. Meanwhile, there would be an incentive to buy a new radio in order to receive the extra stations. Ideally, Radios 1-4, Classic FM and a large number of local stations would switch over on the same day.

Year 5) Multiplex operators should be permitted to switch completely to AAC+.

As discussed above, the current DAB sound quality is unacceptable if the system is to largely replace FM. The broadcasters have demonstrated that they will adopt the lowest audio quality that the regulator permits. Thus Ofcom intervention is required to resolve the sound quality problem. However, a higher sound quality is not appropriate for all stations. A lower sound quality is acceptable for speech-based

stations than for music-based stations, while there needs to be an opportunity for minority broadcasters to operate on DAB at very low-cost.

I would therefore like to propose that Ofcom defines two sound quality standards for DAB using AAC+: basic and hi-fi. The basic standard would match that currently applied to DAB, while the hi-fi standard would match available from FM under good conditions, equating to that obtained at 192 kbit/s using the old MP2 coding standard. All hi-fi standard stations would be required to use stereo. It is not Ofcom's business to state which stations should use which standard. Instead, the rule should simply be that at least half the number of AAC+ stations on a given multiplex should use the hi-fi standard. This rule should be applied from year 3 of the transition plan so that the introduction of hi-fi standard stations provides a further incentive for listeners to buy new radios.

To ensure that manufacturers produce new standard receivers promptly, Ofcom and the BBC should set a date at which the "DAB switchover" timetable will be announced to the public. I would suggest 1 January 2008. After that date, consumers would be strongly discouraged from purchasing DAB radios that are not compatible with the new AAC+ standard.

DRM

There is no guarantee that DRM will be a success, either in the UK or internationally. If DAB provides 35-60 stations for each listener from 2008, and more after a transition to AAC+, there will be little incentive to manufacture or purchase radios that will also receive a handful of DRM stations. This phenomenon can be seen with analogue radios, whereby radios offering long wave are more expensive than those only offering medium wave and FM, while radios with short wave cost more still.

If DRM is to succeed, a "big-bang" launch is needed to provide a critical mass of stations, at least 10 for each listener. To achieve this, Ofcom must make a number of national licences available in the 26 MHz band. In this band, it should be possible to achieve national coverage at much lower cost than on medium wave, as 85-90% coverage should be achievable with around 15 transmitters located at the main high power FM sites. By contrast, national coverage in the mid or upper medium wave band would require 30-40 transmitters with much larger aerials at sites with fewer other users. In addition, large numbers of AM stations would need to be allocated new frequencies in order to clear some of the high power frequencies (i.e. 1152, 1341, 1458 and 1548 kHz).

AM

AM is clearly obsolescent technology. However, there are two major obstacles to its phasing out: the lack of in-car digital radios and the dramatic variation in AM viability with format.

Music-based AM stations, such as Virgin and the gold networks, are losing more and more listeners every year and their owners are openly discussing switching off AM within the next five years. Meanwhile, speech-based stations, such as Talk Sport and Five Live, are retaining a steady audience on AM.

Ofcom should thus phase out AM gradually, rather than announce a single switch-off date. Three measures could be taken to hasten AM's demise:

- 1) Announce that when an AM station that closes, the frequency will not be re-advertised for a replacement AM station.

- 2) Encourage the BBC to switch off its remaining AM local radio transmitters where FM reception is adequate.
- 3) Allow the rural AM stations: Fresh Radio, Radio Maldwyn, Sunshine 855 and Valleys Radio to simulcast on FM. There is plenty of FM spectrum available in these areas. DAB is unlikely to be viable for these stations at present, while it is not known whether DRM will be successful.

A solution for small-scale FM radio stations

Many small-scale FM stations are struggling to bring in sufficient advertising to cover their costs. As DAB grows, their audiences are likely to shrink further. The fundamental problem is that many of these stations are simply too small. If there was real demand for this level of localness, they would get larger audiences. I believe the solution is simply to evolve them into bigger stations. With larger coverage areas, they should bring in a big enough audience to viable. These stations may be expanded in two ways: increasing the transmission area or merging neighbouring stations.

Increasing the transmission area is viable for many small-scale stations. There is still FM spectrum available in many places, while there are towns neighbouring these stations that have only one local commercial station on FM. For example, Faversham and Sittingbourne, Taunton, Gloucester and Stroud, Northampton, Milton Keynes, Worcester, Stoke and Angus (county). In many other cases, there are neighbouring towns and cities, that don't have a similar service, such as Brighton, East County Durham, Leeds, Halifax, Sheffield, Lancaster, Coalville, much of Essex and Huntingdon. Increasing coverage areas thus increases choice for the listener as well as improving the viability of stations.

Before, advertising any further FM licences (see below), Ofcom should provide an opportunity for existing stations to apply for coverage expansion, either on their current frequencies or by adding new frequencies, some of which may be interference limited. Available spectrum throughout the FM band should be considered. A convenient way to administer this might be to invite broadcasters to apply on a regional basis. The same regions used for community radio licensing could be selected, with each region considered once the current community licensing round in that region is complete.

Ofcom should also allow neighbouring stations broadcasting similar formats to merge, maybe retaining separate news and information bulletins at peak times. A total population coverage limit of 500 000 adults might be applied to these mergers.

Increasing the coverage areas of small-scale stations would also make it viable for more of them to broadcast on DAB where capacity is available.

A solution for the Suffolk DAB multiplex frequency allocation

From the GE06 Band III frequency plan, the only DAB channels available for local radio along the East Anglia coast in the 10B-12D range are channels 11B and 12D. Thus, if the Norwich multiplex were to be moved to channel 12D, channel 11B might be available for coverage of Suffolk. The Norwich and Essex multiplexes sharing 12D should be viable as 12D was originally also allocated to Great Yarmouth and Lowestoft. Interference from the third London multiplex may limit Suffolk coverage on 11B, but this would be better than nothing. The Norwich and Peterborough multiplexes sharing channel 12D may not be viable. Instead, Peterborough could

move to 10B, with Kings Lynn re-allocated to channel 12A or 12C. Another option is channel 11C for Peterborough and 10B Cambridge.

In summary, the following frequency plan for East Anglia is suggested:

- Peterborough and Cambridge: 10B and 11C (consider both ways round)
- Kings Lynn: 12A or 12C
- Norwich: 12D
- Suffolk: 11B.

Further FM commercial licensing

There is still FM spectrum available within the commercial radio sub-bands in some areas. For example, Belfast: 106.4, Glasgow: 102.1, Norwich: 100.7 and Southampton/Portsmouth: 100.7 or 105.6.

In Leeds and Sheffield, 88.0 could be used for commercial radio while still leaving 87.6 available for RSLs. In the Midlands, there are spare frequencies in the BBC national sub-bands which could be used for commercial radio. In the North East, 104.9 within the BBC local radio sub-bands is available

Some spectrum could be released by reducing BBC local radio overspill coverage outside the editorial areas. This is significant for Radios Cleveland, Humberside, WM and Berkshire. Furthermore, the BBC's Woolmoor national radio relay may not be needed at all as its whole coverage area could be served from Bilsdale.

Further commercial FM licences are thus technically feasible.

In terms of increasing listener choice and providing an equitable service for listeners in different areas, priority for any further FM licences should go to:

- 1) Areas with only one local commercial service on FM
- 2) Major cities with fewer than four commercial services on FM.

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