MC&A Marketing Communications & Audiences

inspiring audiences to love & value the BBC

Project Mayflower
Digital Radio Mondiale (DRM) Trial

Final audience research summary report

August 2008

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1. Introduction

In Spring 2007 a 12-month trial was set up in the Plymouth area to evaluate the viability of Digital Radio Mondiale (DRM) as a possible replacement for (analogue) medium wave. This followed Ofcom's announcement that existing medium wave licenses will not be renewed after 2012.

The trial used spectrum previously allocated to BBC Radio Devon's Medium Wave transmissions in the Plymouth area (855 kHz); these transmissions were switched off and the station was instead broadcast on the DRM platform for the duration of the trial. Radio Devon's MW signal was switched off on 1st April 2007, and normal programming was broadcast on DRM from 23rd April.

Whilst the trial was first and foremost a technical one, an audience research element was incorporated in order to assess listener response to the technology. Potential respondents were invited to apply to join a trial panel of listeners through BBC Radio Devon itself and the county's local BBC site (www.bbc.co.uk/devon). The research agency Leapfrog Research & Planning was commissioned to select and manage the panel, and to conduct quantitative and qualitative research during the trial.

This report summarises the audience research findings from this trial panel.

2. Management summary of key findings

DRM was considered an improvement on AM/MW, delivering a much more consistent sound to the majority of trial respondents. Sound quality and reception (particularly in daytime hours and nearer to Plymouth) were deemed perfectly acceptable to the majority of those on our panel.

The majority of respondents sensed little difference in sound quality between DRM and FM, though Roberts owners were more likely to rate FM sound quality more highly - both on average rating, and in comparison to DRM.

For most people, the sound quality of DRM could not compete with that of DAB. The level of general reception availability to the panel as a whole was broadly similar across the two digital platforms, with both proving less robust than FM.

Throughout the trial, a minority of panel members encountered reception difficulties in picking up the DRM trial signal. As anticipated, most of these came from the area beyond Plymouth where reception was projected to be daytime-only. So whilst DRM represented an improvement on AM/MW sound quality as a whole, it did not 'solve' the difficulties with reception encountered by people in more marginal reception areas.

If BBC Radio Devon were only available on DRM, around half of the panellists who experienced reception difficulties said they would stick with it. Some consideration needs to be given to the self-selecting nature of the BBC Radio Devon listener panel (and possible 'trial effect') here. Others said they would tolerate it for a while, but then either give up or listen more selectively. Around one in ten would give up altogether.

Consequently, the robustness of the DRM signal would need to be markedly improved if it were to be the only platform on which a station like BBC Radio Devon was available.

Both test radio sets performed well, with the Roberts owners giving the higher satisfaction scores.

Panellists enjoyed the trial experience and, if anything, would have welcomed *more* work to do and more communication.

3. The Trial

3.1 The Mayflower audience panel

Figure 1: The Roberts (l) and Morphy Richards (r) radios used in the Mayflower trial.

Close to 200 volunteers applied to join the panel, from which a final selection of 100 was drawn. Upon agreeing to take part in research exercises to assess their perception of coverage, sound quality and general impressions of the trial sets, each panel member was given one of two radio sets capable of receiving DRM signals (a Roberts set and a Morphy Richards set, *Figure 1*).

Clearly it should be noted from the outset that this was a self-selecting sample. Whilst some attempt was made to be broadly representative of Radio Devon's weekly audience, the volunteer pool had a distinctly male skew, and was also younger than the older core audience for the station. An indication of the demographics of both Radio Devon's weekly reach and the panel is provided in *Table 1*.

Table 1	**BBC Radio Devon weekly reach[1]**	**Mayflower Trial panel**
Men	51%	68%
Women	49%	32%
15-34	10%	14%
35-54	24%	19%
55-64	25%	53%
65+	41%	14%

[1] Source: RAJAR, Q4 06 (12-month weighting), Plymouth Sound TSA

Anticipating that the night-time robustness of the DRM signal would be a key area to explore, triallists were distributed across both the estimated 'day time' and 'night time' coverage zones for Radio Devon's Plymouth transmitter (see *Figure 2*).

In communications with the panel, the DRM trial was billed as a "Digital Medium Wave" trial. This was partly to make clear that the trial was using spectrum previously allocated to the station's analogue MW transmission, partly to limit unnecessary use of 'jargon', and partly to avoid any confusion with Digital Rights Management that might arise.

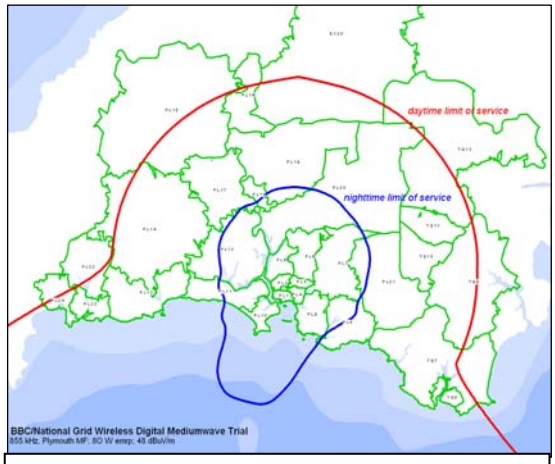


Figure 2: Estimated coverage area for BBC Radio Devon's DRM signal. Red area indicates likely footprint in daylight hours; blue area indicates area likely to have satisfactory coverage in night-time hours.

86 panel members collected radios from the BBC's Plymouth office on one of two 'drop-in' days (16th-17th April 2007), where the relevant radio sets were demonstrated to them and they were given an information pack about the trial. Five more panel members collected their radio sets from the BBC office on 24th April, and the remaining nine panel members had radios posted to them at later dates. Consequently, 100 panel members were recruited by June.

All panellists had internet access at home, and were given access to a dedicated trial message board for the duration of the project. This was intended to enable respondents to record any feedback outside of the scope of the research, and to ask any questions they might have. For some respondents, the message board also helped to establish a sense of a valued virtual community.

3.2 Research timetable

Over the year, as well as monitoring the message board, Leapfrog Research & Planning carried out three waves of quantitative research, and three qualitative exercises:

June 2007: Phase 1 Diary
A seven-day listening diary, focusing on questions around perceptions of sound quality. There was also a more general set of questions relating to their radio listening and the radio sets at the end of the week. 58 panellists completed this exercise, a response rate of 58%. Most (48/58, 83%) lived within the 'night-time' coverage area.

July 24th 2007: Phase 1 Focus Group
Seven trial members attended a group discussion at the BBC building in Plymouth. Respondents were selected to represent a mix of men and women, age groups, Morphy/Roberts owners and postcode areas. Discussion centred on experiences to date with the DRM radios, in terms of reception, perceived sound quality and the sets themselves.

Aug-Sep 2007: 'Half Term Report'
Through the trial's messageboard, respondents were asked to give their general thoughts about the trial to date. 53 responded, and a general summary of themes and issues was produced from these responses.

November 2007: Phase 2 Survey
Panellists were asked to complete a set of listening exercises, following the directions provided. 73 respondents completed the exercises; most (58/73, 79%) lived within the anticipated 'night-time' coverage area. There was a roughly even split between the two trial radios: Morphy Richards (39), Roberts (34).

January 24th 2008: Q&A session at a BBC 'DRM Day'
A delegation of BBC staff attended a DRM Briefing Day in Plymouth and Tavistock, during which summaries of the trial learnings (technical and audience panel) were presented, and after which a panel of five trial members answered delegates' questions about their experiences. The five trial members selected represented a cross-section of the panel.

April 2008: Phase 3 Survey
80 panellists completed the final survey, which included a range of questions about final impressions of sound quality across platforms, and general perceptions of the trial experience. Most (61/80, 76%) lived within the 'night-time' coverage area, and there was an even split of Morphy Richards and Roberts owners (40 each).

June 2008: Phase 3 Depth Interviews
In-home interviews were conducted with five trial members, recruited to represent a cross-section of the panel across the key variables (gender, trial radios owned, postcodes lived in).

Individual summaries of the results and the questionnaires from each quantitative exercise are included in the appendices of this report.

3.3 Listening patterns of the panel

As might be anticipated from a self-selecting panel of people listening to BBC Radio Devon and/or visiting www.bbc.co.uk/devon, a number of panellists were heavy radio listeners - and many of these were very heavy Radio Devon listeners. In the first diary exercise (June 07), trial members reported that they listen to the radio for an average of 20 hours a week - more or less in line with the average UK adult (21 hours, RAJAR, Q2 07) - but a quarter said they listen for more than 30 hours a week. BBC Radio Devon accounted for more than 80% of the first diary sample's total radio listening.

As a result, a number of panel members reported listening to BBC Radio Devon through much of the day. Early morning listening was very common across the first diary sample, with breakfast listening a regular routine for most. Radio Devon and Radio 4 were the most popular amongst the first diary sample, with Radio 1, Radio 2, Classic FM and 5 Live all listened to by some respondents, often for specific reasons (e.g. music, news, sport).

> *"I like to have it playing in the background, especially when I'm on my own"*
> ***Panel member, July 07***

As is typical amongst speech radio listeners, the radio was often left on as background noise for many in the panel, acting as an accompaniment to daily life at home, work and/or in the car according to individual circumstance. When able, many continue to listen to radio throughout the day, and will 'tune in' as and when their attention is drawn. In this respect, radio provides a more personal dimension to media usage compared to the Internet and TV. Informed by previous audience research about radio listening behaviours, the first wave focus group respondents might be considered typical in suggesting that many of the women on the panel seemed likely to use the radio for companionship at home during the day, often as background to housework or cooking. The kitchen was evidently a popular spot for radio listening within the panel, but many trial members also liked to move the radio around the house with them.

> *"Listening to radio allows you to see it the way you want to see it, not how other people want you to see it."*
> ***Panel member, July 07***

> *"Sparksy has become a familiar part of my morning now... Judy Spiers is another one, I love her humour, she always makes me laugh!"*
> ***Panel member, July 07***

In addition, the local connection with BBC Radio Devon meant that many saw the station as providing an invaluable way of keeping in touch with the local community and, indeed, of offering a community in itself. Listeners often talk fondly of the presenters, and a few panel members were known personally to some of the station's programmes through regular interaction with programmes (e.g. the panel member known as "Husky Tina" on the station's John Govier programme).

<u>Impact of the trial on listening patterns</u>

In both the first June survey and the final April survey, a consistent proportion of respondents reported that they were listening to BBC Radio Devon more since the trial had begun. In both surveys, two-fifths of the sample said that they were listening more - and in both cases there was an even split in this group between those who were listening "a lot more" and those who were listening "a little more".

There was certainly some trial effect in evidence here; even in the final survey (April 08), 27 of 80 respondents (34%) said that they were listening more because they were participating in the trial.

The other major factors in increased listening reported in the April survey were:

- To hear a particular programme (16 respondents, 20%);
- The better audio quality on DRM (11 respondents, 14%);
- better reception (11 respondents, 14%); and
- Better audio quality through the DAB also available on the trial radio sets (10 respondents, 13%).

In each phase, only a tiny number of panellists reported that they were listening less since joining the trial.

3.4 Panel response to DRM audio quality

For the duration of the trial, BBC Radio Devon was available on the radio sets as:

- "BBC Devon Trial" on DRM
- "BBC Radio Devon" on DAB
- "BBCDevon" on FM

With the exception of very slight differences in transmission time (owing to a very short delay on digital platforms), the station's output was identical across the three platforms. This section summarises the overall response to the perceived sound quality of "BBC Devon Trial" on DRM; subsequent sections deal with related issues (e.g. comparison with other platforms, night-time reception difficulties in outlying areas, differences between Morphy Richards and Roberts owners) in more detail.

Across all three phases of research, the panel's response to the audio quality of BBC Radio Devon on DRM was generally positive; mean scores for the perceived quality of reception were generally in the range of 7.5 to 8.5. DRM was clearly recognised as an improvement to analogue MW and - for some – was even perceived to be on a par with FM. For those able to receive DAB on their radios, DRM was generally considered inferior in comparison.

In the first wave survey (June 07), respondents were asked to listen to "BBC Devon Trial" on DRM at various times of day across a week. 58 respondents took part in the survey, with the daily reporting sample averaging 54 respondents a day. Across the week, 632 listening occasions were recorded, in each of which respondents were asked to rate their perception of the audio quality of BBC Radio Devon on DRM on a scale of 1 to 10 (where 1 was defined as "terrible" and 10 as "excellent"). Looking at the mean ratings across the week (and dividing the day into "morning", "afternoon" and "evening"), the general response to DRM was positive (see *Table 2*).

Table 2	**Listening occasions**	**Mean rating of DRM audio quality**
Morning (before 12pm)	335	8.19
Afternoon (before 7pm)	152	8.31
Evening (after 7pm)	145	7.59

Source: Wave 1 Survey, June 07 (note small base: 58)

Asked to rate the general audio quality of BBC Radio Devon on DRM, three-quarters of respondents rated it as very good (ratings of 8-10). Only four respondents (7%) gave it a poor rating.

The survey was conducted around six weeks after the start of DRM transmissions, so there may be some 'trial effect' uplift at play here; the mean scores for daytime reception in wave one were never quite matched in subsequent surveys. The BBC trial team were also slightly concerned that some respondents may have been confused about which platform they were listening to BBC Radio Devon on when answering this question; this led to more explicit listening exercises being deployed in the second wave survey.

However, even when taking these concerns into consideration, it seems safe to conclude from the first survey that:

i) Respondents were generally happy with the audio quality offered by DRM;
ii) Reception was not quite as good in the evening (an issue discussed more fully in section 3.5).

In an informal 'half term report' exercise conducted via the project messageboard, most respondents echoed these conclusions of the first wave. Broad satisfaction with reception was reported, tempered for some by breaks in transmission (particularly in night-time hours).

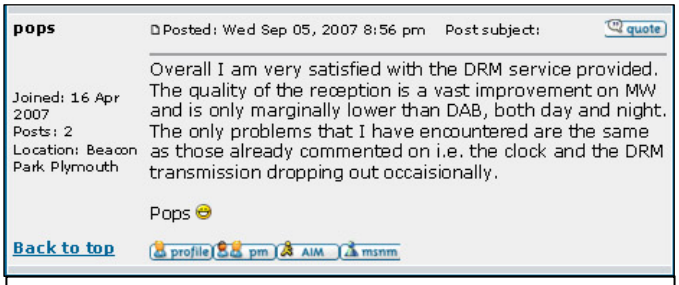


Figure 3: A comment from the 'half term' report, conducted on the project messageboard.

The second wave survey (November 07) asked the panel to complete more prescriptive listening exercises, explicitly inviting comparison between DRM and other platforms. Consequently there was no one set of mean scores for DRM audio quality, but rather a couple of sets comparing DRM to FM and DAB. In total 73 respondents participated in the survey, contributing 200 completed listening tasks comparing DRM and FM, and 184 comparing DRM and DAB. Greater detail from these exercises is included in sections 3.7 and 3.8; the mean scores for "overall sound quality" of DRM in these exercises are given in *Table 3* below.

Table 3	**Listening occasions**	**Mean rating of DRM audio quality**
DRM when compared to FM	200	7.82
DRM when compared to DAB	184	7.99

Source: Wave 2 Survey, Nov 07 (note small base: 73 respondents)

Whilst these mean ratings for DRM are marginally lower than the (daytime) mean scores reported in the wave one survey, at approaching 8 out of 10 they can still be considered indicators of general satisfaction with the perceived audio quality.

In the third and final survey (April 2008), satisfaction with the audio quality across the panel as a whole was still high. 80 respondents, asked to rate the current audio quality of the "BBC Devon Trial" on DRM on a scale of 1 to 10, came out with a mean rating of **7.60**. Whilst it should be noted that the mean slipped progressively through the trial period, it should also be remembered that the questions and evaluation of DRM "audio quality" were in different contexts in each survey. It might also be that we lost any 'trial effect' in evidence in the first wave by the end of the trial. Note also the larger sample in the final wave, and the generally small samples on which the results in each wave are based.

3.5 Reception availability and night-time reception

As indicated by the general satisfaction with the audio quality offered by DRM, it was apparent from early on in the trial that reception quality was good for most respondents. However, throughout the trial, a minority of panel members encountered reception difficulties in picking up the DRM trial signal. As anticipated, most of these came from the area beyond Plymouth where reception was projected to be daytime-only at best.

The robustness of DRM reception at night was an issue for a significant proportion of the panel from early on in the trial. In the first wave survey (June 07), about a third of the sample said they had experienced no problems whatsoever with night-time listening. However, this needs to be evaluated in the context of a panel accustomed to poor analogue medium wave reception at night. Consequently, among those in the area anticipated to receive MW reception in night time hours, half agreed that they had noticed an improvement in reception at night with the switch to digital medium wave. In the first wave focus group (July 07), all respondents reported that the sound quality of (analogue) medium wave locally faded in and out on a regular basis, and was often troubled by interference from static and foreign stations, particularly at night. All seven trial members present reported that these problems had either disappeared or reduced significantly with DRM.

Even so, in the first wave group discussion, several respondents reported that the number of bars on their radio display fell in the evening, leading to potentially more frequent breaks in reception. Others, living in Plymouth itself, reported more consistent reception across both day and evening.

In the second wave survey (Nov 07), respondents were asked more directly about general availability of Radio Devon on different platforms. Of the 73 respondents, two-thirds (48 respondents) were able to receive the DRM signal anywhere in their homes. A further 21 respondents were able to receive DRM in some areas of their homes (though some only with manipulation of the radio set's aerial).

Only 2 of the 73 respondents were unable to receive the DRM transmissions anywhere in their home – though it may be that panel members with limited or no DRM reception were more likely to choose not to complete the survey. The two-thirds who could receive DRM anywhere stands up well to the levels for the same question relating to FM (74%, 54 respondents) and DAB (59%, 43 respondents).

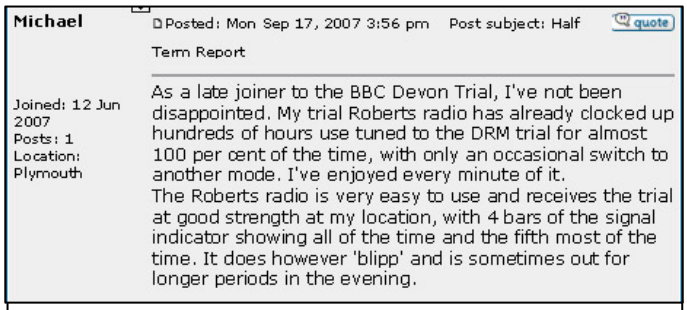
In the same survey, respondents were also asked about variations in reception of BBC Devon Trial on DRM in night-time hours. The two largest groups in the sample either reported consistent/uninterrupted reception (44%, 32 respondents) or some breaks in coverage that still left it "more often listenable to than not" (42%, 31 respondents). Six respondents (8%) had similarly patchy reception, but felt that the balance was more towards unlistenable than acceptable. Only a small minority (4 respondents, 5%) reported unlistenable/non-existent reception at night, but - across a range of possible responses - around a quarter of the sample (24%, 17 respondents) reported some degree of reception difficulty in night-time hours.

For most of those who reported that reception 'comes and goes', the breaks tended to happen about once or twice an hour, but for about a quarter of this group breaks were tending to occur every 30 minutes or even more frequently. When reception broke up, respondents encountered different audio effects; the most typical of these was silence (11 of the 73 respondents), with around 5 respondents each reporting either echoes; distortion/wobbly sounds; or weaker/fading

sound. Individual open answer responses on this matter included *"sounds like Metal Mickey"* or *"an underwater dalek trying to sing opera".* When interrupted, reception was reported to resume most usually within about 30 seconds (22 respondents), although some experienced longer delays of up to 5 minutes (6) or even longer (5). Most efforts to improve reception in these instances proved unsuccessful, but some things that panellists tried successfully included moving the radio to another location (7), moving the aerial (4), and moving their radio nearer a window (2).

As expected, those in the projected night-time coverage zone reported better reception at night. However, even among these people, almost half experienced patchy reception of Radio Devon on DRM at night. On the other hand, even among the 15 respondents outside this anticipated zone more than a third (6) claimed to receive some listenable reception of Radio Devon on DRM at night.

The issue of poor reception in hours of twilight and darkness was also mentioned several times in the half-term report (September 07) conducted via the trial's messageboard. Several of these respondents said that this was increasingly becoming the case, and it is worth noting that this was happening to more trial members as the hours of natural daylight decreased and the trial moved into the autumn.



Michael

Posted: Mon Sep 17, 2007 3:56 pm Post subject: Half Term Report

quote

Joined: 12 Jun 2007
Posts: 1
Location: Plymouth

As a late joiner to the BBC Devon Trial, I've not been disappointed. My trial Roberts radio has already clocked up hundreds of hours use tuned to the DRM trial for almost 100 per cent of the time, with only an occasional switch to another mode. I've enjoyed every minute of it.
The Roberts radio is very easy to use and receives the trial at good strength at my location, with 4 bars of the signal indicator showing all of the time and the fifth most of the time. It does however 'blipp' and is sometimes out for longer periods in the evening.

Figure 4: A comment from the 'half term' report, conducted on the project

When these issues were revisited in the third wave survey (April 08), the results in terms of DRM availability were broadly consistent with the November survey. 63% of the 80 respondents reported good reception day and night, in line with the 66% of 73 respondents to the November survey. In all though, around 90% of the sample reported acceptable DRM reception in most instances, with 41% (33 respondents) reporting constant reception and 48% reporting "more often listenable than not".

Interestingly, among the 19 respondents in the third wave survey who lived outside the night time coverage zone, the vast majority (c. 90%) received some listenable reception of BBC Devon on DRM at night - an improvement from 4 in 10 in the November survey. The small nature of the samples should be noted here, and it may be that some of the respondents took 'night-time hours' to mean the evening rather than 'hours of darkness' - meaning that there were more hours of daylight in April's evenings than November's.

By contrast, while the incidence of panellists stating that reception 'comes and goes' remained largely unchanged from November, the reported frequency of breaks appeared to have increased. The proportion of those citing breaks of once an hour or less decreased, but those citing breaks of once every 15 minutes or more increased. Silence was still the main outcome reported from a loss in reception.

3.6 DRM compared to analogue MW

As discussed in the above section, respondents who were already listening to BBC Radio Devon on MW were accustomed to poor reception, particularly after dark. Consequently, the vast majority of the panel considered DRM to be an improvement, even allowing for interruptions in reception. In the first wave of research, almost all of the 58 respondents agreed that the audio quality was better than that offered by analogue MW, and there was unanimous agreement amongst the seven focus group attendees. In the final survey (April 08), the general view of the panel was similar: compared with MW, DRM had improved night-time listening for seven-tenths of the panel, with one-third feeling it was a big improvement compared with MW (see *table 5*).

"Oh the two (MW and DRM) are incomparable, DRM is infinitely better"
Focus group respondent, July 07

Table 4: DRM and MW question, April 2008.		TOTAL		RADIO TYPE			
				Morphy		Roberts	
		%col	N=	%col	N=	%col	N=
Q17 - How do you think the digital medium wave audio quality compares to the old analogue MW (eg 855 kHz for BBC Radio Devon)?	Digital medium wave is a lot better	**59%**	**47**	55%	22	63%	25
	Digital medium wave is a little bit better	**23%**	**18**	33%	13	13%	5
	It's about the same	**8%**	**6**	8%	3	8%	3
	Digital medium wave is a little bit worse	**4%**	**3**	0%	0	8%	3
	Digital medium wave is a lot worse	**3%**	**2**	0%	0	5%	2
	Don't know	**5%**	**4**	5%	2	5%	2
	Total	**100%**	**80**	**100%**	**40**	**100%**	**40**

Table 5: DRM/MW night-time survey question, April 2008.		TOTAL		RADIO TYPE			
				Morphy		Roberts	
		%col	N=	%col	N=	%col	N=
Q12 - Have you noticed any improvement in night-time listening on digital medium wave (DRM) compared with MW?	Yes, a big improvement	**34%**	**27**	30%	12	38%	15
	Yes, a small improvement	**36%**	**29**	35%	14	38%	15
	No, it is still poor	**10%**	**8**	13%	5	8%	3
	No, it is worse than before	**3%**	**2**	0%	0	5%	2
	I have never had a problem with night-time listening	**18%**	**14**	23%	9	13%	5
	Other	**0%**	**0**	0%	0	0%	0
	Total	**100%**	**80**	**100%**	**40**	**100%**	**40**

Consequently, when asked if they would stick with BBC Radio Devon if it were *only* available on DRM, half of those experiencing reception difficulties in the April survey said they would stick with it (note: almost all from within the night-time reception zone). A further quarter indicated they would tolerate it for a while but give up if it didn't improve, whilst one-fifth would stick with it for something they particularly wanted to hear (e.g. football commentary – a big driver of Radio Devon listening amongst our panel). Only around 1 in 8 of the sample of 80 respondents said they would give up altogether.

3.7 DRM compared to FM

In the first wave diary exercise, roughly half of the 58 respondents felt that the DRM sound quality of BBC Devon Trial was better than that available for the station on FM. As indicated above, there was some concern about 'trial effect' and misattribution of platform in this first survey, leading to a more prescriptive set of comparative exercises in the second wave.

In this second wave (November), 200 detailed tasks were completed by 73 panellists comparing DRM and FM. As requested, the tasks were completed in a variety of locations within the home and at different times of the day/night. Overall, FM and DRM were rated fairly evenly, with the overall mean score rating for FM (8.0) marginally higher than that for DRM (7.8). Given the sample sizes involved, this is not an especially significant variation.

Overall rating		**All**	**MR**	**Roberts**
Sample size		*200*	*103*	*97*
(mean scores)	FM	8.04	7.81	8.28
	DRM	7.82	7.88	7.76
Which was better listening experience for…?				
Sound quality	DRM	34%	44%	23%
	FM	39%	35%	43%
	No diff	26%	19%	32%
Clarity of voices	DRM	33%	44%	22%
	FM	39%	33%	45%
	No diff	26%	20%	32%
Least interference	DRM	35%	42%	28%
	FM	22%	23%	21%
	No diff	42%	33%	51%
Least echoes	DRM	25%	34%	15%
	FM	28%	25%	30%
	No diff	45%	38%	53%
High notes/Treble	DRM	24%	34%	13%
	FM	30%	32%	47%
	No diff	31%	26%	35%
Low notes/bass	DRM	28%	35%	20%
	FM	39%	35%	43%
	No diff	29%	25%	33%
Female voices	DRM	27%	40%	12%
	FM	33%	27%	38%
	No diff	31%	25%	36%
Male voices	DRM	28%	39%	15%
	FM	33%	27%	39%
	No diff	35%	30%	40%

Table 6: DRM/FM listening exercises, November 2007.

Whilst the DRM score was similar across both panel members with Morphy Richards and with Roberts radios (7.9 and 7.8), there did appear to be some difference in the FM rating according to radio type, with the Roberts respondents rating their FM sound quality higher (8.3) than their Morphy Richards counterparts (7.8). Those with Roberts radios generally rated FM more highly in terms of the sound quality, clarity and differentiation; those with Morphy Richards radios consistently rated DRM higher than FM across nearly all attributes (see *table 6*).

Whilst it seems credible that the FM audio on the Roberts radio might be of a better quality than the Morphy Richards set (resulting in the higher score for FM in the former's sample, and the wider gap between DRM and FM, compared to the Morphy Roberts dataset), three other possible variables must be considered before declaring the comparative scores to be definitive. In addition to the first wave concerns about platform misattribution and the potential for 'trial effect' evaluation of DRM:

i) Location points of the Roberts and Morphy Richards radio sets around the trial area. In the second wave survey, a roughly equal number of respondents with each radio were included in the sample; looking at the fairly similar distribution patterns of Morphy and Roberts radios around the trial's geographical area, it seems safe to rule this out as a major factor in the variation.

ii) Respondents with Roberts radios were asked to do four iterations of the listening exercise, varying the order in which they alternated between platforms (e.g. FM -> DRM -> FM for some exercises, and then DRM -> FM -> DRM for others). For the same listening exercises to be performed effectively on the Morphy Richards, owing to differences in the start up and menu navigation, respondents were only asked to go from FM to DRM to FM. This means that, whilst the exercise was consistent in methodology and content, the two sets of DRM v FM exercises were not identical in format.

iii) Respondents who could not receive DAB consistently were asked to do the FM comparison exercise for more iterations instead. The similar geographical distribution of the Morphy Richards and Roberts samples suggests the impact from this would be minimal, but it should still be considered as a potential variable.

Setting those reservations aside, there were some evident differences in response to DRM compared to FM within the two radio groups. When comparing DRM directly with FM, a good two-fifths (44%) of Morphy Richards owner exercise responses claimed the sound quality was better on DRM. In contrast, a similar proportion of Roberts owners' exercises (43%) gave FM the edge. This rating for FM didn't appear to be in relation to any specific element of the sound (when looking at the detailed elements of the aural experience), but as an overall listening experience.

When respondents were asked to switch back to FM from DRM, more than a third (37%) of Morphy Richards exercises resulted in respondents finding the experience worse on FM, whereas the clear majority (80%) of Roberts responses found the experience to be either the same or better on FM.

For the Roberts owners that listened to DRM and then FM, whilst they rated the DRM sound quality as good, almost three-fifths (58%) found the sound quality better when switching to FM, particularly in terms of clarity and tone (treble, bass). On switching back to DRM, one-third found the sound quality on DRM to be equal to FM, while two-fifths believed it to be worse. After listening for a while longer, roughly half of the Roberts owner exercises ended with respondents thinking the sound quality was the same between the two bands. More than a quarter still believed the quality on DRM was worse than FM.

In the third wave survey (April 08), respondents were asked more directly about how they would compare audio quality on DRM and FM (*table 7)*. Interestingly, in this more abstract judgement, around 4 in 10 respondents felt that DRM ("digital medium wave") had the edge on FM. Another 4 in 10 saw little difference, and only one in five respondents felt that FM was superior.

However, it should be noted that three-quarters of the 80 respondents clustered around the "little bit better/worse" and "about the same" judgements - indicating no marked verdict in favour of either platform. Once more though, the Roberts owners were more likely to pick out FM as superior (a quarter of the 40 respondents giving it the edge, compared to only 1 in 8 Morphy Richards owners).

Table 7: DRM/FM survey question, April 2008.		TOTAL		RADIO TYPE			
				Morphy		Roberts	
		%col	N=	%col	N=	%col	N=
Q18 - And in general how do you think the audio quality on digital medium wave compares to FM?	Digital medium wave is a lot better	**16%**	**13**	18%	7	15%	6
	Digital medium wave is a little bit better	**23%**	**18**	20%	8	25%	10
	It's about the same	**39%**	**31**	45%	18	33%	13
	Digital medium wave is a little bit worse	**13%**	**10**	8%	3	18%	7
	Digital medium wave is a lot worse	**6%**	**5**	5%	2	8%	3
	Don't know	**4%**	**3**	5%	2	3%	1
	Total	**100%**	**80**	**100%**	**40**	**100%**	**40**

3.8 DRM compared to DAB

For most of those respondents able to reliably receive DAB at home, the sound quality of DRM was not able to compete with that of DAB. DAB also delivered more consistent service availability and reception in most areas.

In the first wave diary exercise, around half of the 58 respondents felt that there was little difference in the sound quality of BBC Radio Devon on DRM and DAB, though a further quarter indicated that DAB was better. The remaining quarter were split between those who preferred DRM, those who didn't have a reliable DAB and/or DRM signal, and those who were unable to express an opinion. The aforementioned suspicions of trial effect and platform misattribution in this exercise should once more be noted, along with the small sample size.

184 listening tasks were completed in the second wave survey (November 07), comparing DRM and DAB. As with the FM/DRM tasks, these were completed in a variety of locations around the home and at different times of day and night. It should also be noted that, as with the FM comparison exercises, respondents with Roberts radios were asked to vary the order in which they alternated between platforms (e.g. DRM -> DAB -> DRM for some exercises, and then DAB -> DRM -> DAB for others). For the same listening exercises to be performed effectively on the Morphy Richards, owing to differences in the start up and menu navigation, respondents were only asked to go from DRM to DAB to DRM. This means that the two sets of DRM v DAB exercises were not identical in format.

Overall, DAB was rated more highly than DRM (see *table 8*, below). This was largely to do with sound quality and clarity (particularly on high notes/treble). Some also felt the sound level of DRM to be slightly lower.

Overall rating		All	Morphy	Roberts
Sample size		*184*	*91*	*93*
(mean scores)	DRM	7.99	8.02	7.83
	DAB	8.57	8.46	8.66
Which was better listening experience for...?				
Sound quality	DRM	19%	28%	12%
	DAB	51%	44%	57%
	No diff	25%	21%	29%
Clarity of voices	DRM	21%	26%	16%
	DAB	45%	38%	51%
	No diff	30%	28%	31%
Least interference	DRM	21%	23%	18%
	DAB	26%	32%	20%
	No diff	49%	38%	58%
Least echoes	DRM	19%	23%	16%
	DAB	29%	34%	23%
	No diff	46%	34%	57%
High notes/Treble	DRM	17%	24%	11%
	DAB	41%	39%	43%
	No diff	33%	27%	39%
Low notes/bass	DRM	21%	26%	17%
	DAB	39%	40%	39%
	No diff	33%	26%	39%
Female voices	DRM	17%	27%	8%
	DAB	38%	37%	39%
	No diff	32%	24%	39%
Male voices	DRM	21%	27%	16%
	DAB	37%	39%	35%
	No diff	35%	27%	43%

Table 8: DRM v DAB listening exercises summary, November 2007.

"I can't say it's a huge difference, but it's noticeable, especially when you toggle between the two…..DRM sounds just that little bit quieter"
Panel member, Q&A session (Jan 08)

"The reason I listen to DAB more than DRM is really because it's more reliable as it has less breaks in signal…..the sound quality is actually very similar"
Panel member, Depth Interview (Jun 08)

As with the FM exercises there were differences according to radio type, though both Morphy Richards and Roberts respondents rated DAB more highly (note: these exercises were not completed by respondents who had no / very poor DAB reception). With an average rating across the exercises of 8.0, Morphy Richards owners scored DRM marginally more highly than their Roberts counterparts (7.8). The opposite was true for DAB, where the Roberts exercises average was 8.7, compared to 8.5 for Morphy Richards respondents. These differences are not statistically significant.

With only around 30-35 respondents in each group, some caution should be taken in drawing definitive conclusions, but it does appear that the Roberts scored more highly across FM and DAB when compared to DRM - suggesting that the radio itself may have been better at highlighting the differences in the relative sound quality of each platform. A further indication of this would be the wider gap in mean scores between DRM and FM/DAB amongst Roberts owners, compared to Morphy Richards respondents. Furthermore, though still in the minority, roughly a quarter of MR owners found all aspects of the sound quality better on DRM, compared with only one in seven Roberts owners.

Among those listening first to DRM and then DAB, in half (51%) of the exercises respondents found the sound quality/volume greater on DAB, with just over a fifth (22%) feeling it was the same as on DRM.

Among those Roberts owners who listened to DAB, then DRM, then back to DAB, on the first testing DAB was rated very highly for all aspects of sound quality. After switching to DRM, almost half found the sound quality worse on DRM. About a third found the clarity and tone (treble/bass) worse on DRM than on DAB. Roughly a quarter found the quality of speech (both male and female) worse on DRM. On switching back to DAB, more than half rated the overall sound quality better on DAB than on DRM, while just under a third rated the two bands the same.

Little had changed by the end of the trial (phase 3). The audio quality of DRM was considered to be worse than DAB by the biggest group of respondents, with two-fifths stating the audio quality of DRM to be worse than DAB, and only one fifth feeling it was better. One-third felt it was around the same. No one outside of the projected night-time reception zone felt that the audio quality of DRM was better than DAB.

Table 9: DRM v DAB survey question, April 2008.		TOTAL		RADIO TYPE			
				Morphy		Roberts	
		%col	N=	%col	N=	%col	N=
Q18.r02 - And in general how do you think the audio quality on digital medium wave compares to DAB?	Digital medium wave is a lot better	**8%**	**6**	8%	3	8%	3
	Digital medium wave is a little bit better	**10%**	**8**	8%	3	13%	5
	It's about the same	**36%**	**29**	38%	15	35%	14
	Digital medium wave is a little bit worse	**33%**	**26**	33%	13	33%	13
	Digital medium wave is a lot worse	**6%**	**5**	3%	1	10%	4
	Don't know	**8%**	**6**	13%	5	3%	1
	Total	**100%**	**80**	**100%**	**40**	**100%**	**40**

Whilst DAB did appear to provide better sound quality to the ears of the largest proportion of respondents, its availability to the sample as a whole was broadly similar to that of DRM. In the second wave survey, two-thirds (66%) of the 73 respondents could easily receive good DRM reception, compared to 59% for DAB. In the third wave survey (April 08), seven respondents were unable to receive DAB at all, out of a total sample of 80. In the same survey, the 63% of respondents who said that they could receive “BBC Devon Trial” on DRM everywhere they had tried it was essentially matched by the 64% of respondents who could reliably receive “BBC Radio Devon” on DAB. Both numbers were lower than the 79% who had generally universal reception of “BBC Devon” on FM in the April survey (and 74% in the earlier November survey).

3.9 The impact of headphones/speakers (Phase 2 only)

In the second wave survey (November 07) respondents were asked, if possible, to try listening to their trial radios through either headphones or with external speaker(s). This was to assess whether the perceived sound quality of DRM was improved beyond the standard offered by each set's mono speaker. 56 respondents managed to listen to the radio with headphones on, of which two-thirds (37) reported that the DRM experience was better with headphones, with two-fifths (23) reporting it to be much better. A smaller group, one in eight (7), thought that the experience was worse.

Headphone listening also emphasised the difference in sound quality between DRM and other platforms for a majority of headphone respondents. When they switched from the Devon Trial on DRM to BBC Radio Devon on FM or DAB, more than half found the sound quality via headphones to be better than their DRM experience - particularly among those who switched to DAB. Only a quarter of respondents thought that sound quality was much the same - compared to more than a third in both the DRM v FM and DRM v DAB questions in the final survey (April).

Once more though, it needs to be emphasised that - for the majority of respondents - the sound quality offered on DRM by the radios' mono speakers was "good enough". In the November survey, nearly two-thirds of the 73 respondents said that they were happy with mono, with a further one in ten offering no opinion on the matter. However, more than half of the respondents who were happy with mono did also say they would prefer a radio with stereo speakers. A further fifth of the total sample felt more strongly that they would want stereo as standard.

4. The trial radio sets

The overall rating of the trial radio sets remained consistently high throughout the trial, with two-thirds of panellists giving their radio a score of 8-10 (where 10 is excellent) in both the November and April surveys.

Generally speaking, those with Roberts radios were more satisfied with their sets than those with Morphy Richards sets. The Roberts had a mean rating of 8.4 in November (34 respondents) compared to 7.4 for the Morphy Richards (39 respondents), and there was a similar margin in April (8.3 amongst 40 Roberts respondents, 7.5 average across 40 Morphy Richards respondents). Both scores reflect the generally high levels of satisfaction with the trial radio sets.

As you would expect, more than two-thirds of respondents continued to use an additional radio set around the house during the trial. This was mostly in order to have radios in different parts of the house, with about a third of respondents having another radio that runs on battery power, often for outdoor listening in the garden. Even so, of those who did continue to use more than one radio, two-thirds used their trial radio for a clear majority of their listening time.

4.1 Likelihood of buying

In the November survey, respondents were asked whether they would buy the trial set they 'owned' if BBC Radio Devon were only available on DRM. 70% of the 73 respondents indicated that they would buy their radio, which again reflects general satisfaction with the reception and sound quality offered, as well as with the radios themselves. The question was repeated in the April survey, with an essentially unchanged result (69% of 80 respondents).

In line with the slightly higher approval score for their radio, Roberts owners were the more likely to say that they would buy the Roberts radio if DRM were the only way to listen to BBC Radio Devon. In both the November and April surveys, four-fifths stated that they would definitely or probably buy, compared to three-fifths of Morphy Richards owners in both surveys.

It should be reiterated that the panel was drawn from current listeners to BBC Radio Devon, many of them heavy/loyal listeners. To some degree it is hard to distinguish how much this decision process would have been driven by keeping the station itself, rather than a specific endorsement of the DRM platform.

Price sensitivity was apparent when respondents were asked how much they would be prepared to pay for their radio set. In the November 2007 survey, around three-quarters of the 73 respondents felt that their upper spending limit would be below £100. This proportion rose to nearly nine in ten (86% of the 80 respondents) in the April 2008 survey.

Given that both sets would currently be retailing for more than this amount, it appears that DRM radios would face a similar challenge in building sales beyond a niche market to that encountered by DAB prior to the first sub-£100 Pure Evoke-1 set entering the market. The loyal audiences for stations like BBC Radio Devon would be one potential driver of uptake (particularly if the station was only available on this platform), but clearly sets would need to be available in two-figure price bands - especially given that radio listening to BBC local stations for content such as sport commentary and traffic news takes place in a wide variety of locations. To increase the portability of the radios, several panellists suggested that including a battery power source option would also make the radios a more attractive proposition.

Some also found the Morphy Richards radio unit itself a bit too large and cumbersome. Its heaviness meant that some found it difficult to move the set around the house, and this led several trial members to suggest either a handle and/or a reduction in the weight of the power supply to rectify this.

4.2 Features / Functions

In the first wave survey (June 07), respondents were asked to rate the radio across a number of attributes. Despite its lower score overall, the Morphy Richards performs relatively well against these attributes (*table 10*). The small bases and possibility of 'trial effect' at this early stage should be noted.

Rating: 10= excellent, 1 = terrible NB. small bases	**Morphy Richards (27)**		**Roberts (31)**	
Table 10: Radio set evaluations, June 2007.	***8-10***	***1-3***	***8-10***	***1-3***
Audio quality	20	1	16	-
Ease of use	19	1	21	2
Size of screen	22	-	22	-
Speed of tuning into different stations	18	2	14	3

Respondents were also asked in the first wave survey whether they had used any of the various features available on the trial radios and (if so) to rate them. Whilst many had noticed/used the scrolling display offering 'live text' information (and nearly half claimed to have used the Electronic Programme Guides), it was evident that only a minority of respondents had used any of the other features. Only 14 of the 58 respondents (around a quarter) had used either the Record or Rewind functions by this early point in the trial, while only four respondents had used the radio to make timed recordings of radio programmes.

To put the apparently low levels of usage for these features in some context, by the November survey only 62% of the 73 respondents had even used the preset buttons to store favourite radio stations. In this second survey, a similar number (around three-fifths) said they had used the button to 'pause' live radio. Only 41% (30 respondents) claimed to have used the EPG.

In both the June and November surveys, a greater proportion of the Roberts radio owners claimed to have used more of the functions on their radios than their Morphy Richards counterparts. Even so, when asked in November, only six of the 34 Roberts radio respondents claimed to be using the EPG on at least a weekly basis. Only five of the Roberts owners had used the EPG to record programmes by this point, all of whom had experienced failed recordings at some point due to breaks in signal.

On the whole, those who *had* used any of the features found them useful and easy to use. The live pause/rewind function was especially well received, as it offered panellists the chance to control their listening and not miss out on anything in a programme. Several panellists said that they would have appreciated a memory card being included with their radio, in order to take full advantage of the radio's recording and playback functions.

At a more prosaic level, some respondents reported having experienced difficulties in tuning to particular stations, especially when they first started using the radios. Some respondents also reported in qualitative feedback that the on/off button could be erratic on the Roberts radios.

Another quirk reported through most of the trial was the clock on the radios displaying the incorrect time (and sometimes the wrong date). It's thought that the radios were drawing the time/date settings from the strongest DRM signal it could pick up; sometimes this was the BBC Radio Devon test signal, but at other times different stations operating on the platform (such as Voice of Russia) appeared to have outmuscled the Plymouth signal. Whilst this had no impact on the radio's operation, it did have a high irritant value for respondents, who raised it frequently in messageboard discussion and qualitative feedback.

4.3 The radios' screens (phase 2 only)

In the November survey, respondents were asked specific questions about the display/screen on their radios. Most were positive, with around three-quarters (78% of the 73 respondents) rating the screens as either good (30%) or very good (48%). With the larger screen, those with Roberts radios were unsurprisingly much more likely to give 'very good' ratings for all aspects of the screen (quality, size and clarity), while those with Morphy Richards radios were more likely to give 'good' ratings. For example, 91% of the 34 Roberts respondents gave a good/very good opinion of the screen size (65% "very good"), compared to 64% of the 39 Morphy Richards respondents (28% "very good").

The screen's importance to respondents was evident; two-thirds said they looked at the screen at least occasionally when listening to the radio (though only a fifth looked at it every time they listened). Nearly three-quarters (72%) found the information available useful when they did look at the screen.

For those with Morphy Richards radios, the best things about the display were reported to be traffic/travel info (12 respondents, out of 39) and news updates (9). Dislikes included the clock being wrong (6 respondents, see previous section), the slow scroll (3), a jumpy/jerky screen (3) and a difficulty reading the letters on the blue screen (3).

For those with Roberts radios, the best things about the display were reported to be the programme name/details (11 respondents, out of 34), the time (9), and the indication of signal strength (6). The main dislikes were the clock being wrong (5 respondents, see previous section) and insufficient programme info (3).

Not much detail was offered in the way of information that they would like to see made available on the scrolling text display, but suggestions were mostly functional and related to the station's focus - sports/football results (5 respondents), local weather (3), current song/track title (3), and news scrolls (3).

Some Morphy Richards users complained that the curvature of the fascia above the screen meant that users are unable to glance at the screen easily when the radio is perched on a worktop.

"It's frustrating to have to bend down to look at the screen all the time. When I'm in the kitchen and preparing dinner or whatever it'd be nice if I could just look over my shoulder and see it easily"
(Morphy Richards respondent)

Other Morphy Richards users found it frustrating that there was nothing on the screen that indicated whether they were listening to DRM, DAB or FM.

5. Evaluating the trial experience

5.1 Panel perspectives

In the final survey (April 08), respondents were asked a few questions about the trial experience and its operation. Helped by a self-selecting and (largely) engaged panel, opinions of the trial experience were positive; four-fifths rated the trial experience 8-10 out of 10 (where 10 is excellent), and a mean score was 8.1. Reflecting their frustrations with reception outside of daylight hours, those outside the night time zone were less happy, with only three-fifths rating the trial 8-10 - though the mean score was still a creditable 7.3 amongst these 19 respondents.

Figure 5: assorted panel members with their radios

Although three-fifths felt the amount of work they were asked to do across the 12 months of the trial was 'about right', two-fifths felt it wasn't enough. This indicates there was scope to engage panellists in more activities. Related to opinions of the trial overall, those not working were more likely to feel there wasn't enough work involved in the trial.
Along similar lines, seven-tenths of the April 08 respondents felt the level of communication was 'about right', but the remaining three-tenths felt there wasn't enough - indicating there was also scope to communicate more with panellists. Indeed, the most commonly cited suggestion for improvement in running the trial was increased communication from the agency running the trial and/or the BBC. Other popular suggestions for improving the trial included:

- Asking panellists more questions on the forum, and asking them to do more activities;
- Keeping panellists up to date on anything the BBC was doing behind the scenes that might have impacted on reception;
- Responding to technical difficulties on the forum;
- Involving panellists in more face-to-face meetings with other panellists and BBC staff.

5.2 BBC research project manager's perspective

Russell Chant, Research Manager, BBC Audio & Music:

I think the findings as outlined in this report are indicative of the main messages to emerge from the trial. Principally:

1) DRM seems to be "good enough" for a general radio listener. Sound quality and reception (particularly daytime and nearer to Plymouth) were acceptable to the majority of those on our panel. For the most part, these were not expert ears, and 'good enough' is literally good enough.

2) However, the main issue to emerge was reception availability - particularly at night time. Even though panellists told us that they considered DRM to be far superior to analogue MW, bad analogue reception from MW was still generally regarded as better than a complete loss of it with DRM.

3) The radio sets themselves scored highly, but we need to be aware of the trial effect. Panellists were generally very happy with their radios (particularly the Roberts owners), but this was a self-selecting panel of BBC Radio Devon listeners - often dedicated ones. They are more likely to be radio fans and they had been given a free digital radio in order to take part in the trial; would their claimed readiness to pay for a DRM radio to 'keep' BBC Local Radio really lead to wider uptake?

With other work demands frequently impinging on the time available to me and project colleagues to nurture the panel, it was frustrating not to have the opportunity to communicate with the panel more regularly and so get more insights from them. Consequently, the element of the panel that feel 'under-worked' is understandable and regrettable. That said, it is hard to think of much extra detail or research activity that would have added to the principal findings of the trial as a whole.

Time pressures also meant that the briefings offered to Leapfrog (the agency running the project for the BBC) ahead of fieldwork were at times hurried or brief, and led to less granular/informed findings than might otherwise have been the case. We learnt well from the shortcomings of the results from the first wave of fieldwork, and this led to much better insights from the subsequent exercises. Given the hundred-strong panel created, sample sizes (prior to the final survey) were a little disappointing, and chasing up non-respondents in the first wave could have improved both the panel's operation and the quality of the results. Having given respondents a 'free' radio as an incentive, it proved difficult to think of sanctions that might work remotely.

5.3 Agency perspective

Sally Marsden, Board Director, Leapfrog Research and Planning:

We too were disappointed in the small sub samples and although we did chase up non respondents by emails outside of the all panel invitations, the overall sample size was very small for a panel. This was obviously a function of cost and equipment; we would normally oversample by a factor of three on a general consumer panel. Given that this was a self selecting sample, loyal and emotionally close to the brand, then 150 respondents might have been sufficient.

With hindsight, although I have no idea how practical this would be, we could have leveraged the BBC Radio Devon brand more, maybe making invitations and reminders feel as if they were coming from the station.

6. Appendices

For reasons of brevity, full documentation from the audience research project is not included here. Copies of the surveys, listening exercises, panel response and data tables etc. are available upon request, subject to data protection guidelines.