



WORLD DAB Newsletter

International News and Strategic Analysis on Digital Sound Broadcasting

Fourth International DAB Symposium - Singapore

**We are now less than two months
away from this much-vaunted event!**

13-15 January 1999

There is a packed programme with speakers from more than 30 organisations and companies with all the latest information about DAB developments world-wide. Together with the other participants, this will surely be the biggest concentration of expertise on DAB ever – well, certainly since the last International DAB Symposium two years ago!

Of course, things have moved on a great deal since the Third Symposium held in Montreux in 1996. The emphasis now, reflected in the programme, is not mainly on the technology but on implementation – on actually starting services, on regulating them, on making and launching consumer receiver products, on the business aspects. It is an opportunity to share experience, exchange views, commiserate on set-backs or celebrate achievements.

And with the decision to hold it in Singapore, at the heart of the Asia-Pacific Region, there are some particular sessions targeted on activities and prospects in this hugely

important area. There are encouraging signs of interest with more than 150 delegates from the region already registered.

There will be a display area, with all the stands already spoken for, and demonstrations of DAB in action both at the display booths and as part of the main programme.

The highlight of the social events is an evening sponsored by Deutsche Telekom at the Shangri-la Rasa Sentosa Resort on Sentosa Island a short boat, bridge or cable-car ride from the city centre. This will offer an exotic environment in which participants can mingle and relax in the tropical evening warmth.

The current roll-out of receivers in a number of European countries and very soon in Canada is expected to gather pace over the next few months. The Fourth International DAB Symposium is the perfect opportunity to up-date yourself on the latest happenings, to exchange information, and indeed to spread the word to those not yet committed that DAB is not only alive and kicking, but growing up.

The joint organisers, WorldDAB and the Singapore Broadcasting Authority, with the help of many members, are working hard to ensure that this will be a successful, interesting and enjoyable event. So book your place now, if you haven't already done so. We look forward to seeing you in Singapore in January.

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On the Road in Sweden

An ambitious marketing campaign carried out jointly by Swedish Educational Radio, Teracom and Swedish Radio has just been completed and is being acclaimed a huge success. The 3 companies joined forces to carry out a mammoth tour of Sweden, beginning in the North and ending in Stockholm, covering a total of 28 towns and cities.

Roadshows tend to be associated with cool music events which appeal to the younger generation. The idea of promoting DAB as a trendy radio broadcasting medium and a "must-have" accessory for the young was an excellent marketing concept and drawing attention to DAB by means of a 28 metre radio truck was a very clever ploy.

The target audience in this case was the receiver and car retailers and the journalists who are going to play a key role in influencing the take-up of DAB. It was also an excellent opportunity to visit all the regional Swedish Radio stations in 25 of the 28 cities and inform the SR personnel about DAB.

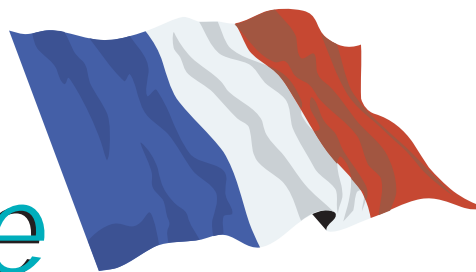
The team set out on 1st September in Kiruna in the northern part of Sweden. The need to begin in the North was dictated by the weather for, by the end, the North of Sweden was already covered in snow and would have made life quite unbearable for those working on the truck.

The truck was equipped with receivers from Pioneer, Grundig, Bosch/Blaupunkt, JVC, Arcam and Roke Manor. Teracom also supplied a small van equipped with a DAB receiver thus enabling interested parties to have a hands-on experience of the enormous differences in DAB radio reception.

During the 8-week tour, some 400 visitors from the retail industry acquired a practical understanding of Digital Radio and left the truck convinced that selling DAB receivers to the consumer would be "a piece of cake". In one fell swoop, therefore, the very first and most important step of the ladder towards the consumer had been climbed! Added to this, the roadshow was well reported in the local press during the tour, amounting to some 40 articles being printed covering the event.

Anita Tenling, Head of Marketing from SR, remarked that she and most of her colleagues found the trip exhausting and very hard work but conceded they all found it a worthwhile experience. The cold conditions did nothing to dampen their spirits and they succeeded in their aim of raising awareness to the retailer.

The Swedish Roadshow is an excellent example of imaginative marketing which could be used in other countries and we wait with baited breath to see the team's efforts bear fruit.



France launches receivers

French Digital Radio (the French DAB Platform) chose the 100th Mondial de l'Automobile in Paris (1-11 October 1998) to launch DAB receivers onto the market.

In France prices vary from FFR6,000 to FFR10,000 (Grundig, Bosch, Clarion, Pioneer and Kenwood). However, Mr Roland Faure, President of la Radio Numerique DAB, said the public in France are no longer querying prices, which is an indication that digital radio has well and truly entered into the implementation phase.

The presence of La Radio Numerique DAB at the Salon de l'Auto and the Press Conference entitled "La Radio Numérique DAB et les Programmes de Radio France" which took place on 30th September, were of particular significance to Radio France, at a time when it is in the process of establishing its future digital strategy and deciding on the level of funding to assign to digital radio.

Radio France and TDF, are exploiting the multiplexes jointly. They established a strategy to serve a minimum number of cities and expand this number at a rate of approximately 5 to 10 new urban areas each year. Radio France is proposing to fund this process with a monthly increase on the licence fee of 5 French centimes.

Paris and the Paris Region are already served by DAB.

Between the end of 1998 and the Autumn of 1999, the following cities will be covered by DAB services:

Bordeaux, Brest, Caen, Clermont-Ferrand, Dijon, Grenoble, Le Havre, Lille, Lyon, Marseille, Metz, Montpellier, Nancy, Nantes, Nice, Orléans, Rennes, Rouen, Saint-Etienne, Strasbourg, Toulon, Toulouse, and Tours.

This rapid expansion will mean that at the turn of the century, 25 million listeners will be able to benefit from digital quality services. That is to say, 40% of the metropolitan population in France.

Another major announcement from France is a recently agreed amendment to the statutes of the Radio Numerique DAB (originally known as Club DAB France). This allows car manufacturers to join the national DAB platform. This is an important step in encouraging car manufacturers to line-fit DAB receivers. The French platform is confident that car manufacturers will respond positively provided that the infrastructure and DAB services are in place and working.

During the CEPT Planning meeting which took place in Wiesbaden in 1995, France was allocated frequencies allowing for a maximum of 9 blocks. However, at the recent meeting of this group in Geneva on 14 to 16 September, it was agreed in principle to expand the L-Band. This will mean that France as well as other countries represented within CEPT will be allocated 16 blocks instead of its current 9.

As soon as this decision is ratified, France will have more DAB programmes which will be available to them thanks to the new allocation of DAB Frequencies. Subject to the agreement of the CSA (Conseil Supérieur de l'Audiovisuel, the French authority for radio broadcasting), the increase in the number of programmes will first benefit the Paris and Lyon regions.

DAB situation in Germany

In May of this year EACEM, EBU and the World DAB Forum issued separate statements saying that the Eureka 147 DAB system would be the digital radio system of the future and DVB-T would remain as a Television system.

In spite of these statements, many months of uncertainty ensued during which the Cabinet of the Federal Government of Germany debated on the new Broadcasting act and which system to adopt officially.

On August 24th 1998 the Cabinet concluded its Report of initiative "Digital Broadcasting", which includes a chapter on digital audio broadcasting. This clearly stated that DAB is the audio digital broadcasting system of the future.

This positive news led the Chairman of the DAB Platform in Germany, Mr Müller-Römer, to conclude that since all the market players in Germany had clearly adopted Eureka 147 as their official audio digital broadcasting system, it was time for the platform to dissolve on 30th September.

The decision, however, has caused some tension as the German Association of Commercial Radios, VPRT, protested that private radios were only willing to concede that DAB could be the digital audio broadcasting system of the future but had definitely not agreed to adopt the Eureka 147 system. During the 4th WorldDAB General Assembly, Mr Reiner Müller, of BLM, confirmed this news but also issued a stark warning to the private broadcasters: if they do not get their places on the national commercial multiplexes they may end up with the same difficulties as they did over FM where they procrastinated so long that there were no frequencies left for them, leaving German Commercial radio in a much weaker position than its public counterparts.

The plan for the near-future is that the majority of DAB pilot projects in Germany will be terminated by the end of 1998. However, in most cases the pilot projects will simply continue as regular services beginning at the latest in Spring 1999.

Frequencies will be assigned starting in

September this year, through a 2 step procedure which will involve: publishing the frequencies available for DAB and allowing interested parties to apply for a licence; allowing the telecoms authority to make a decision if there are several applicants

Licenses will be granted for 15 years.

Of the 11 independent ARD regional broadcasters, 9 participated in the pilot projects, as well as Deutschland Radio, a national radio broadcaster. Thanks to this some 30 million listeners now have the technical possibility to receive DAB programmes in Germany, with most recipients to be found in cities. Of the 120 DAB programmes which can already be received, 90 are simulcasts of existing programmes and 30 are special DAB programmes such as SWR's DAS DING which is a special youth programme. DAS DING is automatically produced and transmitted and carries a multi lingual programme for one hour a week in a special project which is funded by the European Commission.

The most advanced area of Germany is the South, and in particular: Bavaria, Rheinland-Pfalz and Baden-Württemberg. In these areas there is a plan to reach 80% of the population by the year 2000, in channel 12, and by using additional DAB blocks in Band III. They also propose to introduce a second coverage in band L within cities.

In Bavaria, DAB has been in regular transmission since July this year; Bayerischer Rundfunk, Deutschland Funk and the so-called Bavaria Media Technik, founded a joint venture, "Bavarian Digital Radio", with the objective of building the DAB networks in Bavaria.

The Industry has announced that the first DAB receivers will be marketed in autumn of this year, though initially these will be audio-only receivers.

Research taken from the pilot projects shows interest in DAB at its height when it comes to car radios; listeners enjoy the quality of the signals and the steadiness of reception which DAB offers in a mobile situation. However, listeners thought that the areas of reception which have been taken on by the pilot projects are too small and the offer of programmes too limited.

German consumers said they were prepared to spend as much as 1000 DM for car radios with a black and white screen, and up to 2000 DM for a colour screen and remote control, provided that DAB was universally available and receivers were fully developed.

Whilst analogue switch-off for television is planned for 2010, there is no set date for analogue radio switch-off apart from a recommendation that the transition to digital audio broadcasting should be smooth. The German Government has said it will carry out a review of the situation in 2003 which will be based on national and international developments, as well as sales of DAB receivers, and a calendar will be set for radio analogue switch-off.

The WorldDAB General Assembly felt that the situation in Germany had been resolved sufficiently to allow the chicken and egg scenario to end. Until the Federal Government took a stand on DAB in Germany receiver manufacturers were unable to commit to launch receivers on the consumer market and, with Germany being the largest European market it meant that receivers launched anywhere else in Europe would be at a higher price. This in itself has led to a vicious circle which can now be overcome.

Paths to the Digital Future of Radio

Extract from Michael Green's Talk at the EBU Conference - Brussels, October 27th 1998

At the 3rd EBU Conference entitled "European Programmes in the Digital Era" Michael Green, Chairman of the European Affairs Committee, gave a speech on the importance of content in the Digital Age.

With over 200 participants attending the conference it was an excellent opportunity to hear the voice of radio speak out from the crowd of ardent television supporters.

This speech is summarised below:

"Forty- five years ago, the BBC's Ten-Year Plan referred to the "growth of television audiences and the consequent shrinkage of audiences dependent on sound alone". Senior management predicted that the BBC might choose to cut its radio networks from three to two, so that television could expand to fill radio's place. It turned out to be a poor piece of forecasting as the BBC today has five networks and a chain of 40 local and regional stations competing with over 180 commercial stations at national and local level.

A recent WorldDAB survey estimates that:

- **There are over nine thousand radio stations in the fifteen Member States**
- **More than 210 million Europeans listen to radio each day for more than three hours on average**

- **In five countries, principally in Northern Europe, people still spend more time listening to radio than they do watching television and almost everywhere, the balance between viewing and listening is fairly equal**

In Eurobarometer last year statistics showed that Europeans place greater belief in Radio than they do in television or in their newspapers. Total annual income – from licence fees and advertising revenues – is estimated at seven billion dollars. Radio advertising has grown very rapidly and in the first seven years of the 1990's radio's share of European advertising grew from less than one per cent to over six per cent. Both in editorial and business terms this, rather than the 1940s and 1950s, is the golden age of Radio.

It is also an age of immense challenge. Radio has of course already faced and survived several revolutions such as the competition from television, the migration from AM to FM, all these have meant strategic repositioning. Now it's the transition from analogue to digital and radio must be part of this revolution on its own terms.

It is inconceivable that it should remain analogue in the digital multimedia environment and it is inconceivable that listeners should be denied the diversity and choice implicit in the digital future.

So where does Radio stand at the start of this revolution? The first thing to observe is that digital radio has produced a new value chain with a greater number of professional players involved. Now we are in a world of broadcasters, telecommunications and multiplex operators as separate companies (the latter being the gatekeeper and in some respects the alternative regulator). Digital radio is a much tougher proposition to bring to market, requiring partnerships and collaboration right along the horizontal chain which is where WorldDAB fits in.

As you know, the technological solution for the digitalisation of radio signals has been available for about a decade. The Eureka 147 system (DAB), now a world standard adopted throughout Europe, in Canada and many other countries is a brilliant technology which meets

the precise needs of a highly portable and mobile medium. In the United States, where broadcasters resist the notion of being bundled together in a multiplex even here the consumer electronics manufacturers sing the praises of DAB. In Europe it has been slow to emerge but digital radio is now at last a consumer reality albeit an expensive one. But remember that it took 15 years to convert consumers to FM. I recall as a young producer in the 1960s being given an FM receiver. Very few people in the community were able to hear what we were broadcasting because the sets simply weren't available at the right time at the right price. Some of us have been here before!

Radio looms large in the affections of the European public but it's a tiny, fragmented industry in comparison with television. The small broadcaster, so important to the cultural diversity of Europe, is facing daunting additional costs during the long and inevitable period of simulcasting. Even the biggest radio groups are minnows on the world media stage and face the prospect of carrying the burden of digital broadcasting for at least five years. In Television, the large commercial players with deep pockets see significant long-term profits on the horizon if they are successful. Advertising, sponsorship and perhaps above all subscription are key drivers. This long perspective has meant that subsidising the set-top box - the hardware- is an acceptable risk in trying to kick-start the market. In Radio, the risk is relatively just as great but the returns are likely to be much more modest within the business horizon of even the most robust commercial operators. And pockets are nowhere near as deep. So there is no question of subsidy. The market must create its own dynamic.

The manufacturers have been cautious despite having invested an estimated 180 million ecus in DAB so far. A new technology like this needs a pan-European market and it also needs a climate of regulation which removes as much uncertainty as possible in the shortest time frame. I'm not sure we have helped ourselves as much as we might. Take the question of spectrum. Digital technology does not free Radio as it does television from shortage. The prospect of hundreds of new channels available to each

household – a key marketing message for television – is not for Radio. Current allocations do not allow all existing radio broadcasters, particularly at local level, to migrate to digital and that implies the need for regulation which creates a fair market place for all players.

It has to be said at this point that the public broadcasters have been in the driving seat so far. That's not surprising. They have both the funding and the obligation to assume the leadership role in promoting new technology and in several countries the public sector has invested heavily. The private sector has come to the stage rather more slowly and with different levels of commitment and interest in the various Member States. I have no doubt however that DAB will be at greater risk without the full and active involvement now of commercial radio. In many countries they are the dominant players with up to 75% of audience share in France, Spain and Italy and a growing presence elsewhere. There is nonetheless a perception in some parts of the commercial sector that their late arrival has disadvantaged them with regard to the allocation of frequencies. It is important that the regulatory framework takes sufficient and timely account of their needs as well as those of the public broadcaster.

The UK model is I believe a useful one with the BBC leading the way and Government regulation has ensured a substantial place for both sectors. The launch of the new commercial multiplex DigitalOne next year will be a valuable stimulus for the whole market.

Little wonder then that manufacturers decided to launch their first car receivers into the British market three months ago a move followed by France where public and private sectors have also combined in the general interest of DAB, an example of collaboration along the horizontal chain.

Creating an appropriate regulatory environment particularly for commercial broadcasters is at the heart of the matter for digital radio. Extending analogue licences and relaxing ownership rules as a trade-off against digital investments, regulating with a light and generous touch so that broadcasters can find new revenue streams through datacasting, considering more favourable fiscal regimes - these and other measures might help DAB. Each Member State will make its own cocktail but for those of us in WorldDAB, it is essential that we pull down as many of the barriers as is consistent with the public interest. And then there are issues with a supranational

dimension. The Wiesbaden Plan for example might be sufficient for the initial implementation of DAB but the lack of frequencies for the medium term will distort competition and threaten the new technology. Such problems can be solved if the political will is there. We need international co-ordination and long term planning. We need European solutions for DAB frequency shortages as a matter of priority.

Despite the lack of any co-ordinated marketing strategy and the varying rates of progress in establishing an appropriate regulatory framework, there are positive signs that digital radio is on the march.

But whatever the roll-out strategy in the short term, two things are clear:

~ **unless there is a distinctive range of new services on DAB, the market may falter**
~ **Radio may be largely just audio at the moment but we need to recognise that DAB is probably a new medium. It is already, with broadcasting on the Internet, at the cutting edge of convergence.**

Exploring the possibilities of digital radio, adding value to our current editorial and business propositions, will be the core of all radio strategies going forward. All this opens up a very exciting landscape for everyone in Radio: the development of the PC card with links to the home computer and the dream of the virtual radio set; the chance to store favourite programmes, the opportunity for radio to become both multimedia and interactive via GSM or another technology; the prospect of conditional access and the business opportunities that might present; and beyond all this, at the heart of Radio, the simple but enduring delight of receiving new programmes which at the moment are squeezed out in the analogue crush.

There is so much going for radio. As consumers take greater control of their media consumption, radio's ability to address the individual, to refine messages in the age of micro-marketing, seem to me to give it a powerful niche in the digital future. Its capacity to talk to people on the move seems to be a perfect fit with the peripatetic audiences of the future. Its ability to bridge the gap between the information rich and the information poor is unique. Its location at the heart of the smallest communities is unmatched. Its core values – trust, intimacy, companionship – are beyond price. What's needed now are steady nerves and brisk co-ordinated action by all the players to ensure that Radio's digital future is as glorious as its past. There is no other path."

News Bytes...

from the EBU Conference

During the EBU Conference the Director-General of EC DGX (Information, Communication, Culture, Audiovisual), Mr Spyros Pappas, drew the participants attention to the Commission's initiative "Radio in the Digital Age", which was held on 5th March in Brussels. It is thanks to this event that the Commission has begun to promote the status and role of Radio in the European Union.

Mr Pappas confirmed, as he had done at the Prix Europa in Berlin the previous week, that Radio was fully integrated into the Audiovisual Policy of the Union, which includes actions in support of the development of European audiovisual programmes.

On TPEG

BBC Digital Radio has announced its pilot of the world's first travel data service using pioneering TPEG (Transport Protocol Experts Group) technology and information provided by BBC Travel News. BBC Travel News is a 24 hour travel service providing information on all forms of transport in the UK and Europe using comprehensive information sources including computer links to transport operators, traffic control centres and live links to European partners. The pilot starts in January 1999 and is set to revolutionise traffic information services. It will allow the BBC to broadcast more travel news than could even be crammed into the full 24 hours on a radio station.

The Transport Protocol Experts Group, commissioned by the EBU's Broadcast Management Committee, was established in autumn 1997 to develop a new protocol for broadcasting travel and traffic information for use in the multimedia broadcasting environment.

A number of manufacturers have declared an interest in validating TPEG from real transmissions and the BBC pilot will offer them the opportunity to test TPEG transmissions on navigation systems and route planners and text and speech based devices. Drivers would be able to choose how much information they want to receive and have the facility to use TPEG to plan routes in advance or suggest alternative routes. The TPEG pilot will not only be available via DAB, but will also be accessible on the Internet to companies wishing to test TPEG's capabilities. This will allow companies throughout the world to use the BBC data stream.

The Transport Protocol Experts Group is developing an open specification where results will be visible and open to all. All relevant industry sectors are involved from consumer electronics manufacturers, digital map suppliers, and content providers, to service providers and transmission operators. There are no national barriers with European, US and Japanese companies taking part.

By Jennifer Teague,
Press Officer, BBC Digital Radio

Making multimedia radio a reality

“Content, content, content”, will be the secret to digital radio’s success, according to Swedish Radio’s Director General Lisa Soederberg, speaking at the 4th WorldDAB General Assembly. The view is shared by WorldDAB’s Steering Board, which has set up a new group to accelerate development of multimedia radio and value added services.

The group, Module 5, will focus on Multimedia Radio. It will be chaired by Steering Board member Glyn Jones who is excited by the challenge. “Today’s digital radios in the shops are about audio, audio, audio,” says Glyn Jones, “and that’s a strong proposition for early adopters. But over time, many people think multimedia alongside the digital audio will become more and more important to consumers. Across Europe, people are developing multimedia content to broadcast using Eureka 147 digital radio. But it’s happening in a very isolated way. My vision is for Module 5 to bring the pioneers together to share knowledge, skills and insights.”

The initial plan is to hold a half-day conference with presentations and demonstrations from a range of broadcasters and content creators. “We’ll hold the event in a city where we can also visit one of the creative teams working in multimedia radio, to hear first hand experiences, look at the production technologies and see some demonstrations.” The key participants will be the content creators, but Module 5 activities are also expected to be of interest to receiver manufacturers planning multimedia receivers or PC card products.

WorldDAB’s Steering Board decided to go ahead with the new group, despite anxieties that the new module might detract from the initial consumer proposition of digital radio. First generation car radios and hi-fi sets focus on digital radio as and audio product, although some receivers also offer DLS radiotext. However, the Steering Board decided that Module 5 should be treated as a priority, to create the foundations for the multimedia radio products of the future.

Plans are being developed for the initial conference, and anyone interested in participating should contact Julie Unsworth (unsworth@worlddab.org) for the most up to date information. Glyn Jones is hoping his enthusiasm will prove to be infectious. “At the BBC we have developed an exciting vision of multimedia radio, and have completed multimedia versions of everything from science documentaries to pop music radio shows. Like other broadcasters we’ve also experimented with broadcast web sites and travel data. Module 5 will enable us to share our experience and, more importantly, to learn from everyone else.”

WorldDAB draws up new Strategy for 1999

During its 4th General Assembly, the World DAB Forum voted in favour of adopting a new strategy for 1999. This strategy will concentrate on a European roll-out as it is clear that the rest of the world is looking to Europe before committing to Eureka 147.

The four key points of the strategy are:

1. Facilitate the coordination of all the stakeholders in creating positive conditions for DAB rollout.

- Work at the national level with broadcasters and distributors to create infrastructure and program services.
- Work with receiver manufacturers and car manufacturers, at the most senior levels, to facilitate a mass marketing of DAB receivers. Understand the barriers as they see them and broker the necessary changes to overcome these barriers.
- Facilitate marketing strategies between broadcasters, distributors, manufacturers and retailers.

2. Address spectrum issues and create more spectrum in L band for terrestrial use.

- Develop a World DAB position on spectrum and work with the relevant institutions to ensure that those who are willing to commit to DAB have the spectrum required.

3. Lobby European institutions and national institutions to ensure common policies and regulation to the degree possible to aid a full European rollout.

- Share national success strategies and case studies.
- Be present at key forums, policy gatherings and conferences with papers and presentations that ensure that DAB Eureka 147 is the preeminent technology for radio’s digital future.
- Target specific political and bureaucratic leaders and provide information sessions and what we need from them. Do this in concert with representatives of the stakeholders.

4. Be and be seen as the credible source of DAB information.

- Publish a first class newsletter on a regular basis (once a month). Informative, easy to read and slick.
- Present papers and articles that focus on the benefits of digital radio to all relevant publications. Target at least one article a month in major European countries.
- Begin to develop information material on the benefits of DAB beyond sound; multi media, commercial applications and the potential business case for the private sector.



Agreement is reached by the Eureka 147 Consortium and the World DAB Forum



*Historical signing of WorldDAB/Eureka 147 Agreement
(From left) Franc Kozamernik, Julie Unsworth, Frans Westra, Per Erik Selemark, Michael McEwen and Egon Meier Engelen.*

The 4th WorldDAB General Assembly marked the beginning of the merger between the Eureka 147 Consortium and the World DAB Forum. During a historic moment, when for the first time a research and development group joined forces with an implementation body, the Chairman of the Executive Committee of the Eureka 147 Consortium, Mr Egon Meier Engelen and the President of the World DAB Forum, Mr Michael McEwen, signed an agreement which will move the Eureka Project Office to the WorldDAB Project Office in London.

Eventually, the technical work carried out by Eureka 147 will take place within a Technical Module of the World DAB Forum which will be an add-on to the current Module 1.

It is without a doubt that this close knit co-operation between the two organisations will speed up the DAB roll-out during the course of 1999. With many of the Eureka members already signed up as members of the World DAB Forum the new slimline working of the organisation will also increase efficiency.

As of January 1st 1999, questions relating to the Eureka 147 Consortium should be addressed to:

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Calendar of Events List of DAB Events in 1999

| | |
|---|----------------|
| World Telecommunications | |
| 1-2 December 1998 | United Kingdom |
| Vietnam Broadcasting (Sound/Lighting) | |
| 4-7 December 1998 | Vietnam |
| 22nd IC&C | |
| 8-10 December 1998 | France |
| Cable and Satellite Asia '98 | |
| 9-11 December 1998 | Singapore |
| BCS India '98 | |
| 9-11 December 1998 | India |
| CommsIndia '98 | |
| 9-11 December 1998 | India |
| Consumer Electronics Show | |
| 7-10 January | USA |
| 4th International DAB Symposium | |
| 13-15 January | Singapore |
| Pacific Telecommunications Council '99 | |
| 17-20 January | Hawaii |
| COMMSPIHERE '99 (URSI) | |
| 25-28 January | France |
| London Motor | |
| February | United Kingdom |
| New Media and Broadcasting | |
| February/March | Belgium |
| Wireless '99 | |
| 8-9 February | USA |
| Broadcast Technology Indonesia | |
| 10-13 February | Indonesia |
| AES Europe | |
| 13-16 February | Germany |
| Cable and Satellite '99 | |
| 16-18 February | Australia |
| Middle East Broadcast | |
| 6-9 March | Saudi Arabia |
| NAB '99 | |
| 17-22 April | USA |
| Broadcast Asia | |
| 6-9 June | Hong Kong |
| Montreux TV Symposium | |
| 10-15 June | Switzerland |
| CommunicAsia '99 | |
| 22-25 June | Singapore |
| SMPTE 99 | |
| 13-16 July | Australia |
| Thai Broadcast '99 | |
| 1-4 August | Thailand |
| IFA 1999 | |
| 27 August – 5 September | Germany |
| NAB Radio Show | |
| 31 August – 3 September | USA |
| World Motor | |
| September | Frankfurt |
| Broadcast Philippines | |
| October 99 | Philippines |
| Telecom '99 and Interactive '99 | |
| 10-17 October | Switzerland |
| Telecom Malaysia 99 | |
| 10-13 November | Malaysia |
| BCS India | |
| 9-11 December | India |
| COMMSINDIA | |
| 9-11 December | India |
| Broadcast Asia 2000 | |
| 6-9 June, 2000 | Singapore |

The WorldDAB Project Office does its best to ensure that these dates are correct. All dates are subject to revision.

Combined list of WorldDAB and Eureka 147 Meetings in 1999

(Status December 1998)

| Group | Date | Location |
|--|---|--|
| General Assembly | 28-29 October | Rome |
| Steering Board | 12 January 29 March 10 June 9 September 27 October 14 December | Singapore London Geneva Amsterdam Rome London |
| Module 1 | 15 (pm TF's)-16 March 24 (pm TF's)-25 May 14 (pm TF's)-15 October 6 (pm TF's)-7 December | London London London London |
| Module 2 | 8 (pm)-9 March 17 (pm)-18 May 21 (pm)-22 July 18 (pm)-19 October 29 (pm)-30 November | London London London London London |
| Module 3 | 22 March 1 June 1 September 8 December | London London London London |
| Module 4 | TBC | TBC |
| European Affairs Comm. | 28 January 26 March 2 June 23 July 1 October 26 November | Brussels Brussels Brussels Brussels Brussels Brussels |
| 4th Intl. DAB Symposium Committee | 11 January 1999 | Singapore |
| Finance Committee Meeting | TBC | TBC |
| Eureka 147 General Assembly | 26-27 October | Rome |
| Eureka 147 Executive Committee | 30 March 9 June 8 September 25 October 13 December | London Geneva Amsterdam Rome London |
| Eureka 147 TF A | 19-21 January | Erlangen |
| Eureka 147 TF DSS | 2-3 February | Panasonic, Langen |
| Eureka 147 TF-VM | 28 January 25-26 March | London London |

These meetings could be subject to changes. If this is the case all WorldDAB and Eureka Contacts will be given advance notice.

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