RGS

# ENG INF

The quarterly for BBC engmeenng, technical and operational staff

*SPRING 1991 No. 44*

# THE NEW NETWORK ID ENTITIES

The new Network Identities for BBC 1 and BBC2 were launched on 16th February.

The clocks are generated digitally by new D&ED equipment while the moving sequences (symbols) are stored on special laser videodiscs. The BBC 1 symbol is again based on the familiar rotating globe but the BBC2 symbols are individual sequences lasting up to a minute each.

Each symbol can be augmented with text to identify the region and to indicate if Ceefax subtitles or Nicam stereo sound (in the future) is being transmitted.

The equipment used to generate and store the new Identities is described on pages 27 and 28.


H. Pres. Tel.

*The new BBC2 network clock*

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# ENGINF

Edited;designed and typeset by EID, Room 4616, White City
Tel: White City (07) 24316

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You'll see from the address above that EID is now based at White City.

We made the move in early April - some six months ahead of schedule. Our floor in HWH was urgently requirE1d by Radio Drama, whose existing accommodation in Broadcasting House is now due to be revamped under the "Top Deck Project". So apologies if *Eng Inf* is somewhat late this time round.

Contributions for the Summer issue (No 45) should be sent to me - at the new address - by Friday 24th May. However, it would be a great help if you could let me knowyour plans well in advance, so that I can advise you on the amount of space available for your story.

Fa rewe II Oxford Street, Tottenham Court Road et al - it's been a great delight working in this area over the years.

Mike Meyer
3 April 1991

# SAFETY
## To withdraw or not!

In a domestic environment, should you leave it in at night or, for safety reasons, should you withdraw it? Safety Services Engineering is often asked this question about the mains plug on electrical equipment.

Firstly, switching off at the equipment itself is *not* adequate, because the switch on some equipment leaves parts of it powered up - with a potential risk of fire.

Our standard reply therefore is that electrical equipment must be isolated when not in use, and unplugging is a good way of doing this. However, an acceptable alternative is to switch off at the wall socket, if that is possible. This method also has the advantage of reducing the mechanical wear on both the plug and the socket.

Finally, although this is not strictly a safety matter, switches which are combined with volume controls tend not to be so reliable; also, the volume control wears out more quickly. In this case, it may be preferable to simply switch off at the wall (or unplug the equipment, if there is no wall switch) without switching off at the equipment.

David Davis
M.S.S. Eng.

# TRANSMITTER NEWS

The following services opened or changed between 15th December, 1990, and 28th March:

TV relays

| | |
|---|---|
| Finchley | North London |
| Hamstead | Birmingham |
| Lewes | East Sussex |
| Ystumtuen | Dyfed |

The Brighton Central relay, which opened on 14th December, was modified on 31st January to provide a service towards the south for the first time (but at reduced power). This followed an agreement reached with the French authorities, after prolonged discussions. Transmissions to the south will step up to full power later in the year.

FM stations

| | |
|---|---|
| Chalford | Gloucs |
| Grantham | Lines |
| Westwood | Wilts |
| Weymouth | Dorset |

Radio 1 on FM

| | |
|---|---|
| Bow Brickhill | Bucks |
| Llanddona | Anglesey |
| Peterborough | Cambs |
| Whitehawk Hill | Brighton |

Radio 4 on FM

| | |
|---|---|
| Forfar | Tayside |
| Llanddona | Anglesey |

Local Radio

A new FM transmitter for Radio Suffolk opened at Lowestoft in late January and, on 11th March, Radio Leicester's FM transmitter at Copt Oak stepped up to power. Copt Oak now replaces the Anstey Lane transmitter, which will shut down on 3rd May.

# lEE AWARD

Our congratulations go to Peter Sarginson - a young RD Engineer - who was awarded second prize at an lEE Short Papers evening in mid February. The event was organised for younger members of the lEE's Surrey Centre.

Peter's presentation was entitled *VCR programming made simple* and his prize was £50 plus a certificate.

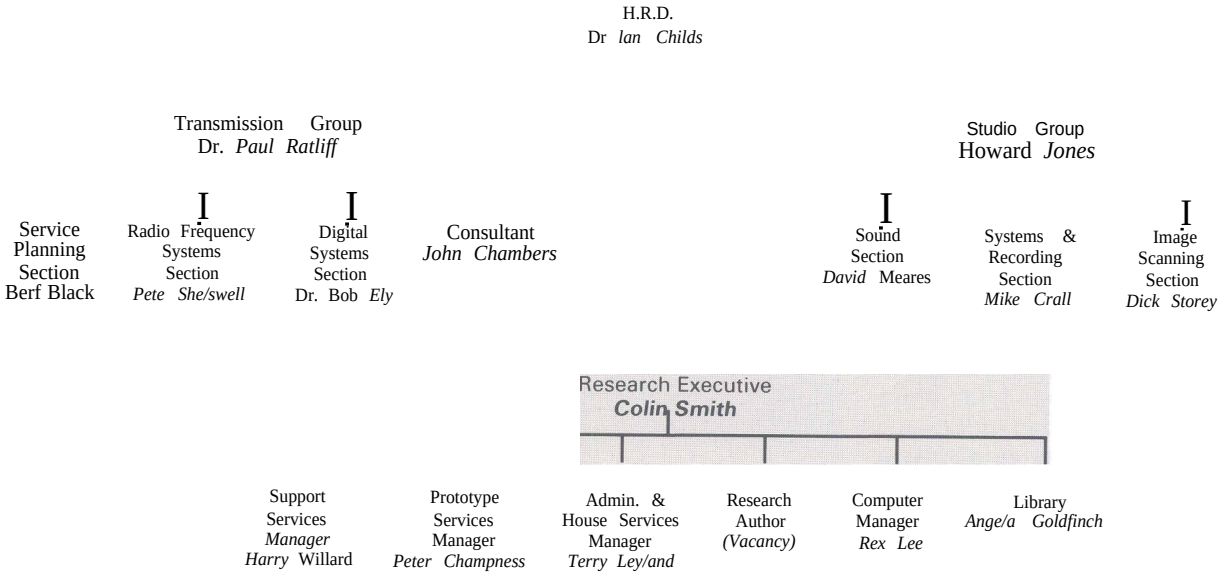
# CORRECTION

Graham Whitehead of D&ED rang to say that a small error had crept in to his feature on Loudspeakers in our previous issue.

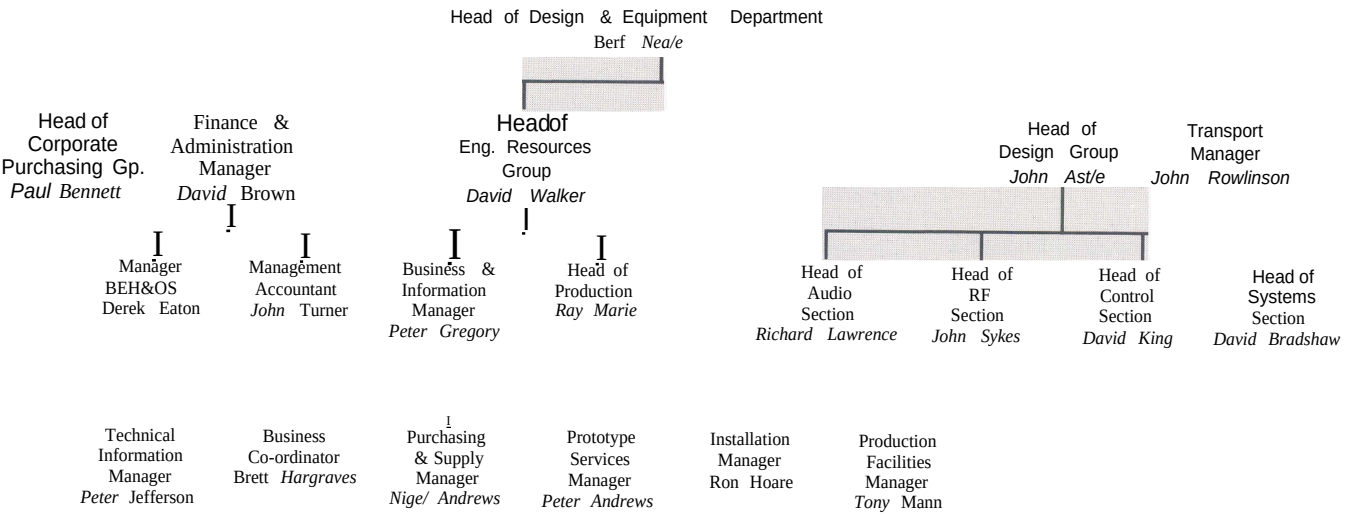
Under the heading *Yesterday's monitors* on page 7, the LS3/7 should have a Spendor 12-inch Bextrene cone woofer (LS2/1), and not an 8-inch unit as stated.

# FAMIL Y TREES
## Research Department and D&ED

In our previous issue we published a diagram showing the new structure of Engineering Management. So here are two more family trees for your collection: Research Department and D&ED.




*Research Department - March 1991*




*Design and Equipment Department - March 1991*

# DIGITAL AUDIO BROADCASTING

Digital Audio Broadcasting (DAB) is at a fairly advanced level of development, although there is still some way to go before we can expect a UK-wide multi-channel service. Henry Price describes the progress so far.

The Compact Disc is one of the most successful consumer products of the last decade. First marketed in the UK in 1983, the sales of CD players were running at just under 2 million per year by 1990, and over 25% of households had at least one player.

The use of the CD (and other consumer digital sound systems) has thrown into sharp relief the shortcomings of the present VHF-FM radio broadcast system. Being analogue, the FM system's overall performance is the sum of the performances of the individual parts of the chain. The quality heard at home or in the car is often limited by either the receiver and antenna performance, or reception problems such as interference, multipath distortion or inadequate signal level. Many dedicated radio listeners go to considerable trouble and expense to overcome such problems and, with care, the FM system can then deliver a performance approaching that of the CD. However, many other listeners end up with an inferior service not comparable with CD quality.

For some years engineers have been looking at ways in which a digital radio service could be broadcast to the general public. Such a service would ideally have the following features:

- Sound quality comparable with the CD
- Capable of offering coverage to all listeners
- Capable of fixed, mobile and portable reception with a simple low gain antenna
- Simple push button programme selection - no tuning
- Frequency efficient so that many services could be provided in any spectrum available
- Capable of operation from satellite and/or terrestrial transmitters

Nicam Tests

Since the 1970s, research engineers in various countries have been looking at ways in which these requirements could be met. In the mid 1970s, BBC Research engineers investigated the possibility of providing a digital radio service based on a Nicam stereo signal. A series of tests was conducted in the North East of England using the Pontop Pike transmitting station near Consett, County Durham. The Nicam digital stereo signal was radiated from this site using 4-phase 0 PSK modulation of a 47 MHz carner.

*The Renault Espace which carried out DAB tests in South London last year*

A vehicle was equipped to receive and decode the signals. Two antenna systems were used; firstly, a directional antenna mounted on a 10 metre extendable mast and, secondly, an omnidirectional antenna mounted on the vehicle's roof. It was found that reception on the directional antenna at IOmwas generally satisfactory within the predicted service area of the transmitter. However, reception was not possible over a significant proportion of the service area when using the vehicle's rooftop antenna. This failure was generally caused by multipath reception which resulted in considerable intersymbol interference to the digital signal.

It was concluded from the tests that 'simple' digital systems, such as Nicam, could provide an excellent service to fixed directional antennas at roof top height (as anyone able to receive Nicam stereo tv will testify). However, reception on omnidirectional antennas close to the ground was unlikely to be satisfactory, especially in highly built-up and mountainous areas. Thus in order to cope with mobile and portable reception, a more advanced digital system would be required.

Over the last few years such an advanced system has been developed and tested within Europe. Two project groups - from the EBU and Eureka project 147 - have been jointly working on a system known as Digital Audio Broadcasting (DAB). This system is specially designed for mobile and portable reception and can be transmitted terrestrially or from satellite or even a mixture of both.

The Proposed European DAB System

If a DAB system is to be capable of mobile and portable reception, it should be able to operate in poor signal-to-noise conditions and with significant amounts of multi path interference. Although many digital coding and modulation systems cope well with poor signal-to-noise ratios, the problem of failure due to multipath reception has been more difficult to resolve. In a simple digital system, such as the tv stereo sound system (Nicam), intersymbol interference starts to become significant once the delay between the main and reflected signals becomes