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The London Marathon

by Alan Woolford,
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It has always been considered that the most demanding programme from a Communications point of view is the Universities Boat Race from Putney to Mortlake. In recent years, however, coverage of the London Marathon has provided an even greater test of Radio Links resources. This year it came only two weeks after the Boat Race! The live Marathon programme covered the 26 miles 385 yards from Blackheath, past the Cutty Sark, Jamaica Road, Tower Bridge, The Isle of Dogs, The Tower of London, up The Mall and the finish at Westminster Bridge with continuous uninterrupted coverage.

From a television point of view the event is divided into two distinct parts. There is the race at the front, which has to be shown in the same professional way as any other athletics event. Then there is the spectacle of the thousands of fun runners and celebrities as they pass the well known landmarks, egged on by the crowds; the street parties; and the festivities along the route. The first requires continuous coverage of the leaders, using mobile cameras, and the second, a large n}lmber of static cameras distributed at places of interest.

This year, there were twenty-three cameras in twenty-eight positions along the route with OB units located at Blackheath (four cameras), Charlton Park Road (one), Woolwich Barracks (one), Cutty Sark (three), The Jamaica Road Street Party (one), The Tower (three), The Mall (five) and finally Westminster Bridge (four). There were also two portable single camera units (psc's) dropping

Heletele in action, with remote camera in ball - Photo Helicopter Hire

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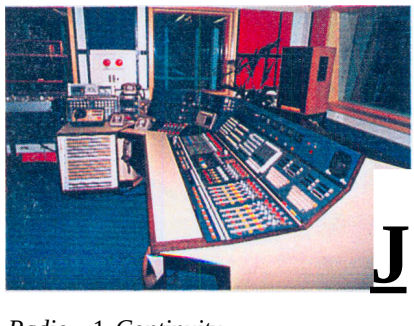
Radio 1 Moves to Egton

Two new Radio I continuity suites, K and L, came into service in April. They have been included in a new complex that has been built from a suite of offices in Egton House near BH. Each suite consists of a control cubicle with its associated studio in which a disc-jockey can take over the running of the network.

A special feature is a fibre-optic link via the Egton House apparatus room to the main switching frame in BH. By means of a solid-state logic system a large number of outside sources can be switched through the fibre-optic link into programmes. Each suite has also access to fifteen cartridge mathines, three EMT 950 gram decks and two compact disc players. It is the first time compact disc players have been included as an integral part of the desk itself.

The cubicle desk is a BBC-



Radio 1 Continuity

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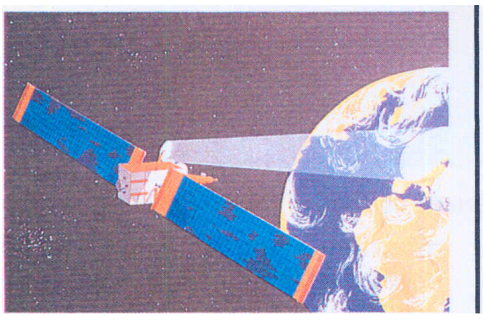
DBS Project Abandoned

The recent collapse of the DBS consortium must be disappointing news to many engineers. Despite the technical attractions of satellite broadcasting, the UK DBS project has been abandoned in its present form because of dollbts about its financial viability.

During the first few years of a subscription-based DBS service, the operating costs, such as the costs of programming, satellites, billing and administration, will exceed the revenue from subscriptions. Assuming reasonable growth in the number of DBS subscribers, the income from subscriptions might cover the costs during the fourth year of the service, and lead to profits in subsequent years. With luck, these profits should be ample compensation for the losses incurred at the beginning of the service.



If the growth in the DBS audience did not meet expectations, the service might not break even until, say, the sixth year. As the guaranteed life of the satellite might be only 10 years, profits in years 7 - 10 would be unlikely to offset the accumulated deficits in previous years.

Even worse. it may become obvious after a few years that the DBS project is doomed to failure and hence the project would need to be aborted having incurred massive losses.

In summary, DBS is an expensive. high risk project which is unlikely to yield a high rate of return on investment. One intrigi.ting thought is that it might be possible to squeeze a high definition television signal into a DBS channel. Ilcnce it might be sensible to delay the DBS projcct until the early 1990's when suitable large screen displays will probably become available for domcstic use.

Radio 1 at Egton
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designed and built Maxicon DK2/25. It contains control panels for the microphone, the studio repro, the cubicle repro and outside source channels. There are six microphones; five for guest speakers coming up on a single sub-mixer and a separate microphone for the presenter, who can control all the microphones from the studio desk. The studio repro panel gives control of six zero-level sources located in the studio. They can be in any combination of gram decks, cartridge players, tape decks or compact disc players. The cubicle repro panel duplicates the controls, which it can either override or delegate to the studio. The outside source panel provides access to ten stereo outside sources.

Four telephone balance units, UN 19/47, have inputs from two direct-exchange lines and two EBX lines. These are fed into the continuity.

The selection of outside sources is made by a Qwerty keyboard. A visual display shows whether the correct source is to line. Errors made when entering the source or destination information is corrected by logic in the system itself.

The apparatus room is unique in the large number of facilities it handles. It provides power supplies and technical services to bot11 the Egton House and Langham Street premises. These include the programme presentation suite in which 'jingles' and trailers are produced, the gram library suite, the quality monitoring area, the rf broadband equipment and the continuity reception desk, with its video security cameras and monitors.

Radio 1 Cubicle

The project took two and a half years to complete. The continuities were built into an. area which had previously been a suite of offices. Geoff Bottom of SCPD the project leader for the London Control Room and Continuities, had the overall responsibility for the area. Although John Clarke of SCPD as project leader for the continuitics K and L had day-to-day responsibility for them; he retired at Easter with their completion. He was assisted by SCPD engineers John Tidy and Kevin Wise. T ony Robinson of ACED was the architect principally concerned in designing and supervising the building work.

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Transmitters Opened

The following uhf transmitters have opened since April:

Felixstowe	Suffolk
Horn Street	Kent
Gravesend	Kent
Pwll-glas	Clwyd
Woodcombe	Somerset
Boddam	Grampian
Glespin	Strathclyde
Lamberhurst	Kent
Mickleham	Surrey
Glenelly Valley	Co. Tyrone
Wattsville	Gwent
Eardiston	Worcester
Sedlescombe	East Sussex
Skirmett	axon
Mochdre	Clwyd

The following vhf transmitters have opened or changed:

Llanrhaedr-ym -Mochnan t	Clwyd
Llanfyllin	Powys
Ballycastle	Co. Antrium
Llanddona	Gwynedd

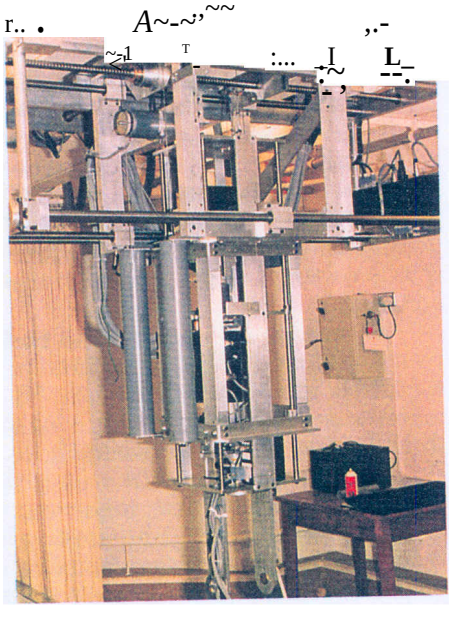
The following local radio transmitters have opened or changed:

The Wrekin	R. Shropshire
Shrewsbury	
Ludlow	
Woofferton	
Sandy Heath	R. Bedfordshire
Luton	
Bedford	
High Hunsley	R. Humberside

"Copies of the 1985 Transmitter Pocket Booklet are now available by ringing LUll 5040."

As-Iarge-as-life with Macro-Glide

Engineers and the Film Unit Manager in NPC Bristol were posed quite a problem when the Natural History Unit asked for a macro-television facility that could move in any direction. The success of the macro-bench, (see Eng Inf No 11) showed that it was possible to use a fixed camera and moving subject to produce exceptional television pictures. However, John Downer, a producer with the NHU, wanted the same sort of camera magnification, for the "Intergalactic Garden" programme but the camera needed to move to follow the subject around a miniature set, and still maintain the magnification.



The Macro-glide facility

Denis Valitis, Engineering Services Manager at -Bristol said, 'We had to translate the production requirements into an engineering specification. Furthermore, the timescale was very short; we were only given the problem in January, and the facility had to be completed by the end of April".

A room in the basement of 19 Tyndalls Park Road was set aside for the project, which became known as the "Macro-Glide". A team was put together which combined the talents of builders, mechanical engineers and electronic engineers. Building Services Manager Gerald Porter was set the main tasks of converting two basements into the new studio and providing two RSJ support beams that would carry the weight of the Macro-Glide. Arthur Mockford (since retired), the Mechanical Maintenance Supervisor, had the difficult task of building a metal support cradle for the macro-camera that would allow it to move in any direction. Paul Townsend from Special Facilities had the problem of controlling the glide and putting the pictures onto the screen.

The specification called for the glide to move 2.5 metres along the length of the studio, 1 m across the studio and have a vertical movement of 0.5 m. The camera would be able to rotate through a full 360 degrees, limited only by the control cables. All this to happen at speeds of up to 0.25 metres per.second.

The macro-glide would be suspended from the ceiling via the two parallel RSJ's. These needed to be erected to within a millimetre tolerance because the tracking rails had limited adjustments for alignment over the 2.5 metre movement called for in the specification. Underneath, an aluminium alloy support structure would carry the four main stepping motors, counter balance weights, and Ikegami HL 79D or film camera.

The glide was designed and built section by section in the mechanical workshops. No drawings were available so each piece had to be machined to fit as the project progressed. The pre-fabricated parts were then dismantled and re-erected in the basement room when the builders had finished the support beams.

Meanwhile the control of the camera was causing a few problems. A simple joystick would provide comparitively coarse control in only two dimensions. Therefore a pressure sensitive joystick control was obtained from the American aerospace industry. This enabled the velocity of movement to be controlled by simple pressure; the 'harder the pressure the faster the movement. Up to six movements are possible from this joystick, though only four are actually used. The "thumb" button may eventually be used for future developments such as banking and tilting, thus achieving an "in flight" effect.

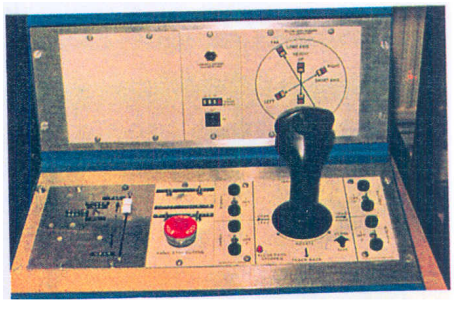
In the basement, the clearance between the floor and ceiling was insufficient for the elevation range. Some thought was given to reducing the size of the mounting frame, but various mechanical constraints prevented this. The only viable solution was, therefore, to lower the basement floor by 0.25 m, and then re-lay the concrete. Pressure on the time-scale meant that this had to be done over the Easter weekend, the additional work was completed in record time. Luckily there was only one "unknown hazard", a drainage pipe that had long since been dis-used.

A three-phase electricity supply was installed to reinforce the building's power supply so that the scenes could be lit to tv production levels. HMI discharge lamps were purchased because these provide a high intensity light source, while not being so hot that the specimens die.

The building work finished, the glide and associated electronics came together, and within forty-eight hours the system was working. The problems were not over however, the slight judder caused by the stepper motors was apparent under high magnifications and at slow speeds. The pendulum effect of the glide caused a small back-lash effect which was partially corrected by extra strengthening of the frame.

The glide met 90% of the producers requirements a remarkable achievement in view of the different engineering disciplines involved and the short timescale of the project.

The NHU were delighted with the new unique facility and have already asked if the speed and elevation range can be increased. Having discovered the potential of the glide, they 'would like more and more facilities. Plans are being made to interface the individual movements onto a small personal



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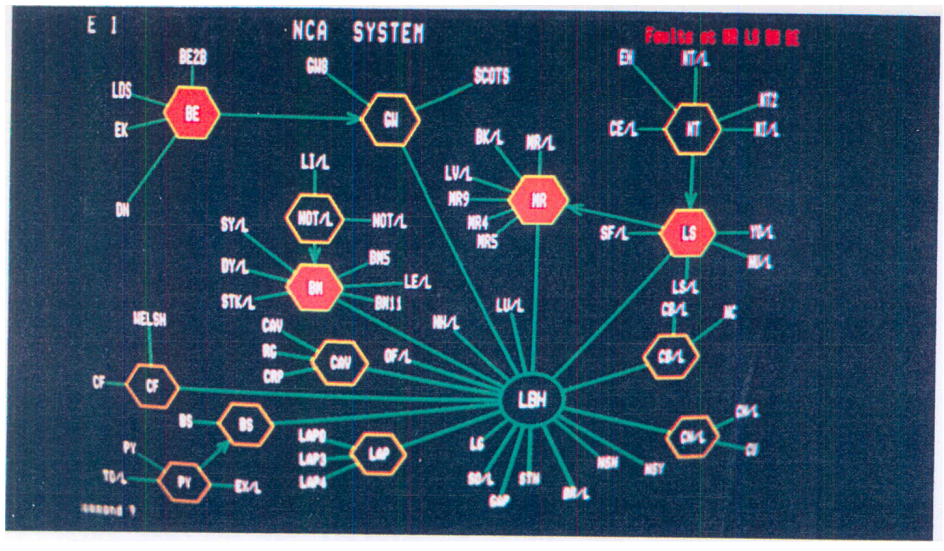


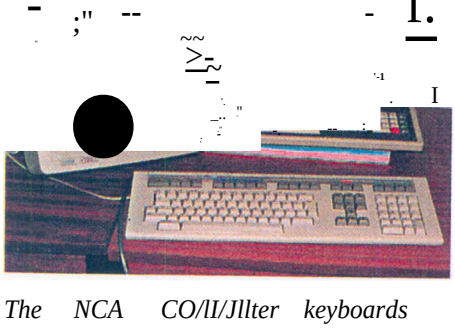
The NCA computer display showing simulated faults at Belfast, Birllingham, Manchester and London

News Routing by Computer

Providing circuits for contributors to Radio News and Current Affairs (NCA) Programmes will be made much easier when a new computerised routing system is introduced in London.

At the moment, for domestic contributions, studios are routed to the News Traffic Area via an open-mix gystem. This is comprised of simple resistive mixers located mainly at BBC Regional centres. The mixers may have up to seven different sources directly connected. The NCA operator in London allocates a route which may pass through one or more centres in, say Leeds or Manchester. This system has worked well over the last ten years or more, but the increasing number of studios around the country, (currently around fifty), means that there is often a conflict of priorities when two studios need to pass through the same open-mix unit.

It was therefore decided, that the open-mix units should be replaced by remotely controllable audio routers so that exclusive routes could be established between the contributing studio and London. This would also allow the provision of cross country lines which would enable some studios to reach London by an alternative route should their normal route be in use. The problems were:- How to communicate with the remote audio routers, and how to control and display the state of the network in a way that could be simply understood.



The NCA CO/lI/Jlter keyboards

A computerised system seemed to be the answer, so SCPD and Radio Networks produced an outline operational specification which was put out to competitive tender. The contract was won by Micro Consultants Computers who assisted in developing the detailed operational and technical parameters. Micro Consultants Computers not only wrote the software but also wrote the final specification. The whole package was delivered on time, without bugs, and on price; a major achievement in view of the outline nature of the specification for which they had tendered.

The system hardware in London consists of a DEC Micro PDPll/23+ computer with a high resolution graphics board. This is coupled locally to twin floppy disk drives, a colour monitor, a vdu and two keyboards. At the regional centres the open-mix units have been replaced by audio routers manufactured by Gl(~nsound Electronics with a control protocol based on the LBH NTP routing system.

The data for con trolling the routers is fed from the computer in the News Traffic Area to the Audio Test Area in LBH via a fibre-optic link. here it enters the Communications Department statistical data network for transmission to the regional cen tres.

The NCA operator can select a studio by entering a shortform code for the studio required. The computer will offer a route if available and provide details of any alternative routes, the information being displayed graphically on the colour monitor. The display in fact resembles familiar network routing drawings. Different colours are used to show the current state of the network i.e. the studios and lines in use or faults encountered. The vdu is used to provide information on the studio from a database file e.g. contact phone numbers, type of desk, tape machine etc and any peculiarities such as limi ted access hours or keyholders. Thus having selected a source and checked the details the operator can con firm the route and make the connection.

A printer is connected to the computer and this provides a useful hard copy of events. It records every operation and can thus be used for traffic analysis. It also records any faults in a coded message format that engineers can interpret and then organise repairs.

To check the serviceability of the routers, each router contains a built-in-timer which is scanned and re-set by the computer every five minutes. This is designed to ensure that the router does not become locked-up due to data link failure.

If a fault is encountered, it will be logged on the printer and a warning displayed on the colour monitor. If, after 15 minutes, the fault is not corrected then the timer will switch the router concerned, to a pre-set state, similar to the old 'open-wire' condition.

In the event of computer failure, all of the routers will switch automatically to the pre-set state.

The SCPD project leader was *loe* Willis with Radio Networks represented by Graham Clifford, and Radio Projects by Bev Marks. Peter Holman was the Comms Department contact.

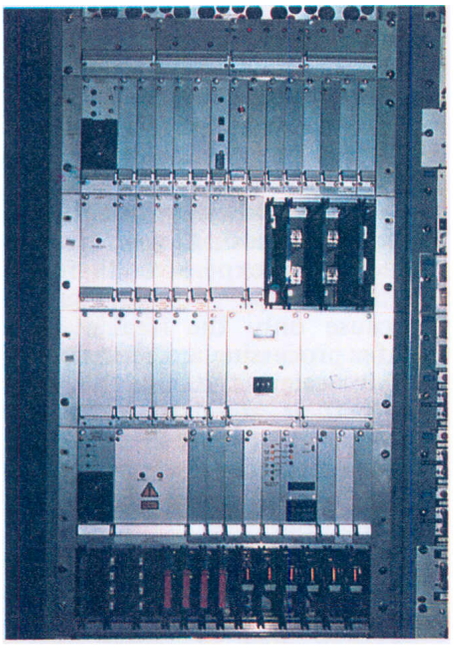
Remote OB System

It has been apparent for some while that it is not always necessary to have staff at an OB fixed site to set-up and check the correct operation of the masthead equipment. The necessary acljustments and monitoring could be carried out remotely from the associated regional communication centre. Designs Department have produced a remote control system that provides this facility.

Following on from the re-engineering of the Outside Broadcast masthead systems by TCPD, reported in the Autumn 1984 edition of Eng Inf, remote control facilities are now available at some regional sites, Le. Manchester Plaza, Holme Moss and Kirk 0' Shotts. Control equipment is installed in Manchester CTA for Plaza and Holme Moss and at Glasgow for Kirk 0' Shotts.

Equipment is currently being prepared for installation at Sutton Coldfield and Wenvoe.

A similar system has been installed between the Swains Lane and the Crystal Palace OB site, so that the masthead equipment at Crystal Palace can be controlled by an operator at Swains Lane. The SHF installation at Crystal Palace being larger than in the regions (6 rotating aerials instead of 4), the remote control features have had to be enlarged to suit the extra control requirements.



Remote COl/trol Elluipl//el/t at CP Swains Lane, showing five rotating SHF aerials - 1 at the top and 4 half-way down

The switching arrangements in the wave-guide system connecting SHF aerials to receivers and transmitters at Crystal Palace are quite complex and a microprocessor-based rou ting selector has previously been provided to simplify the setting-up operation and reduce the likelihood of operator error. This equipment now forms an integral part of the remote control system.

All systems contain the following control features. On/off control of powered equipment, vision matrix selection, panning control for the aerials, and selection of aerials to receivers/ transmitters via the waveguide system.

Panning control consists of commands for clockwise or counterclockwise rotation and a 'stop rotation' command. Fine movement is achieved by a clockwise or counterc1ockwise 'inch' command, giving an angular displacement of about 0.2 degrees per command. For alignment on frequently used bearings thumb-wheel switches allow a three-digit bearing (1 deg. accuracy) to be sent as a command, causing the aerial to rotate to this bearing in the direction requiring the smaller angular change. If an aerial is inadvertently left rotating then a 'stop rotation' command is generated automatically after about I minute.

Various arrangements exist on different sites for the handling of sound signals both as matrix selections and control of equipment associated with RF links. In some locations provision is made for the reversal of line circuits between the Communication Centre and the OB fixed site.

All equipment states are reported back to the operators's position and any detectable failures signal an alarm condition. Any spurious alarm from a known equipment mal-function can be inhibited. The bearing of an aerial being controlled can be continuously repeated together with the AGC reading from the receiver selected to tha t aerial, while adjustments are taking place. Any change in the state of the controlled equipment forces a 'change of state' message into the bearing/ AGC readings to keep the operators display up-to-date.

Communication is by BT circuits, signals in each direction being at 2400 bauds. Line failures are detected and a failure incoming to the masthead terminal produces an alarm signal back to the operator if the outgoing circuit is functioning correctly. Essential sections of the microprocessor unit at the masthead terminal are battery maintained so that the state of the equipment under control can be retained in memory during a failure of the mains supply. When the supply is restored, the previous state of all controlled devices is established without any action by the operator who is inform~d by the alarm system that there has been a mains supply interruption.

The main microprocessor in each terminal is composed of ZEDS units. AJ)other processor is used in the conversion between parallel binary data to and from the main processor and the serial data transmitted and received by means of a modem connected to the BT circuits.

Crystal Palace has additional facilities to operate vision and sound monitoring ma trices, which route signals to Swains Lane on monitoring circuits. There is also selection of vision and sound test signals available. Control can be assumed at eitherlocation allowing local operation at Crystal Palace when required.

Sutton Cold field and Wenvoe

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