

XIII COMMONWEALTH GAMES SCOTLAND 1986



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SUPPLEMENT

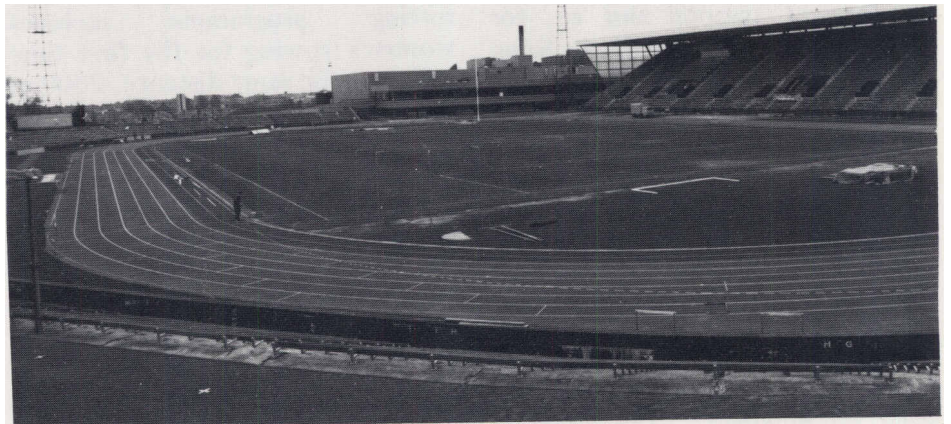
BBC-HOST BROADCASTER

The XIII Commonwealth Games are going to be the BBC's most complex and exciting Outside Broadcast reaching an audience all round the world and involving one thousand BBC staff on duty in Edinburgh. This supplementary issue of "Eng Inf", the BBC's engineering quarterly presents the background of the Host Broadcaster operation, some details of the various OBs and the preparation of the purpose-built Broadcast Centre.

We cannot expect our vast audience to appreciate the enormous efforts of planning, engineering and production that are going into the Games. Broadcasting

at its most effective when its techniques are least conspicuous - if the audience is made conscious of technology it usually means that there's an error in production or a failure of equipment. If this is true of broadcasting in general, it is even more true of broadcast engineering in particular. As engineers we provide the framework which sustains the skills of our production colleagues. The engineering for the Host Broadcaster operation at the XIII Games is on a massive scale and, for the broadcasts to be successful, it has to be right - first time!

The Host Broadcast team has been able to call on resources from all parts of the BBC. Brendan Slamin, Project Director, acknowledges that the size of the Corporation has been a tremendous



Meadowbank Stadium

asset in planning the Games coverage. As early as 1982 he was able to sketch out the pattern of the OBs and relate them to the vehicles and crews that are available. Without the strength of centralised planning within a single organisation the operation would have been virtually impossible. As it is other calls on BBC resources have been reduced to a minimum for the period of the Games although all the other regular sports events are being covered - as is the Royal Wedding.

The Host Broadcaster operation is no showcase of new and untried technology but the scale of the operation needs a Broadcast Centre designed to suit the Games. The BBC has never built a temporary operations centre on this scale

before and so to design, build and test all the studios, working areas and circuits has been a major challenge to the ingenuity of the PID Television team working under the guidance of Geoff Key of OB Section. The entire process has taken three years.

The largest number of broadcast engineers in Edinburgh for the Games consists of the BBC operational staff who work in the scanners, man the studios, operate VT machines and staff the Central Technical Area of the Broadcast Centre. Last, but by no means least, are the Communications staff who are mounting a huge operation in co-operation with BT to link together the venues, the Broadcast Centre and the home countries. Edward Trickett.

The Friendly Games

Remember 1970? Remember the Closing Ceremony of the IX Commonwealth Games when the athletes danced round the Queen's carriage as it travelled slowly round the track? That was the last occasion that the Games were held in Edinburgh and that was when they earned the name of "The Friendly Games".

The Commonwealth Games have always been a smaller and more intimate affair than the Olympics. With only 10 sports and lasting only 10 days (compare the Olympics' 23 sports and 15 days) the Commonwealth Games have managed to avoid some of the worst excesses of the larger event. The Games take place every four years and are open to competitors from the countries of the Commonwealth. For this purpose that includes the dependent territories as well as the independent nations and so, for example, Gibraltar and Hong Kong are both represented. The home countries all have separate teams and by home countries we mean not just Scotland, England, Wales and Northern Ireland but also the Isle of Man, Guernsey and Jersey. More than 50 countries are sending competitors to Edinburgh this year.

The ten sports are selected by the host country from a list of 16 - just two, athletics and swimming, must be included. The other 8 sports chosen by the Scots are: badminton, bowls, boxing, cycling, rowing, shooting, weightlifting and wrestling. None of these is a sport conducted on a purely team basis - those are specifically banned because the Games are "contests between individuals and not contests between countries" (Article 8 of the Commonwealth Games Constitution). So sports like hockey and football do not appear but team events do have their place in the 10 sports chosen, for example, the relay races in athletics, the fours and eights in the rowing.

In practice most of the sports chosen are the same as those selected four years ago - the odd one out this year is rowing which was last included back in 1962 in Perth, Australia. The Scots are taking advantage of their national



The Broadcast Centre dining room with a mural by Glasgow designer, Peter Duelling.

water sports course at Strathclyde Park which is set in more attractive surroundings than its English equivalent in Nottingham. The rowing programme includes women's rowing for the first time and over the same distance, 2000'11, as for men.

Another newcomer to the Games is synchronised swimming, coming in as part of the swimming programme in addition to the swimming and diving. The Royal Commonwealth Pool, which was built specially for the IX Games in 1970, is again the venue for these events. The other venue built for the 1970 Games, Meadowbank Stadium, is once again home for the athletics and for the Opening and Closing Ceremonies.

The Host Broadcaster has a special part to play in the Opening Ceremony. Much of the ceremony follows a strict order laid down in the Games Constitution but it includes a display which, for the XIII Games, is being produced by the Host Broadcaster. Stewart Morris of Television's Light Entertainment Department is responsible for the production on behalf of the BBC. Televising the Sports

It's simpler to think of the Games as ten separate live OBs rather than one big OB. Most of the sports are covered in a straightforward manner producing a single output from the scanner. This consists of international vision and international sound which is fed

back to the Broadcast Centre by SHF link or, in the case of Bowls, by underground cable. To guard against possible failure of the link we are using one VT machine at each venue to produce a continuous archive or guard recording while another machine is used for slow motion action replays. Three events need out-of-the-ordinary OB production - athletics (track and field), the marathons and the rowing.

Track and field athletics are naturally seen as the centrepiece of the Games. They involve the largest numbers of competitors and they require the most complex broadcast coverage. At any one-time as many as three events can be taking place - a race on the track, a jumping event and a throwing event. Producers at the Broadcast Centre want to be free to choose any of these events so that means we need three live vision circuits back to the Broadcast Centre, one for track events and two for field. A fourth circuit provides pictures continuously from a wideangle camera which the producers can use for shots linking between coverage of different events. With so much going on there's a heavy demand for interviews with athletes - usually "flash" interviews at the trackside. One camera has been designated as the interview camera and its output is also continuously fed by a fifth circuit back to the Broadcast Centre. As if that wasn't enough, a sixth circuit is

allocated unilaterally to BBC Television to allow the home audiences to follow the fortunes of the British competitors without affecting the Host Broadcaster coverage.

Marathons are part of the athletics programmes but their 26 mile 385 yard course means a special operation for live television. The course starts and finishes in Meadowbank stadium and extends east along the south shore of the Firth of Forth to a turning point at Longniddry. The usual coverage for a marathon is to have a number of cameras at fixed positions along the course plus mobile cameras on the road and in the air to follow the leaders. The complication this time is caused by the need to cover both men's and women's marathons separately - and the starts of the races are only 30 minutes apart. Anyone who saw the London Marathon will remember that we used two ground mobile cameras, one on a motorcycle and one on the four-wheeled buggy, plus a helicopter-mounted camera. The same arrangement is planned for the Games marathons except that the ground mobiles will follow the men's race from the point where the athletes leave Meadowbank until the leaders re-enter the stadium. Then they will return to cover the crucial closing stages of the women's race, the last 30 to 40 minutes. We are providing separate continuous coverage of the women's marathon by using the

fixed cameras only until the mobiles can join in. While both races are taking place there are three circuits through to the Broadcast Centre: one carrying the men's marathon coverage, one the women's marathon and one showing the continuous output from the lead vehicle.

Rowing has not featured in the Commonwealth Games since 1964. This year's competition is at the new Scottish international standard course at Strathclyde Loch alongside the M74 between Motherwell and Hamilton. The Scottish course is very attractive, being set in the landscaped surroundings of the Strathclyde Country Park, but the pleasant surroundings have given us a new problem to solve. The course is 2000 metres long and the crews race six abreast. To cover the races effectively we need cameras which can move alongside the boats and look across the course - the following camera technique used in the Boat Race won't do for six-lane racing. Although the edges of some six-lane rowing courses are straight allowing the use of lorry-mounted cameras the edge of Strathclyde Loch is curved. As a result we need to mount the cameras on a boat which can travel as fast as the crews but which produces only a minimum wash so as not to disturb the crews. The boat used is being borrowed from Swiss television who use it every year to cover the major international regatta at

Lucerne. Altogether eight cameras are in use - two on the boat, two at the start, one at the 1000m mark, one at 1500m, one at the finish and one at the boating area where the crews embark and disembark. On final days there's a ninth camera viewing the events from a helicopter.

The BBC as Host Broadcaster

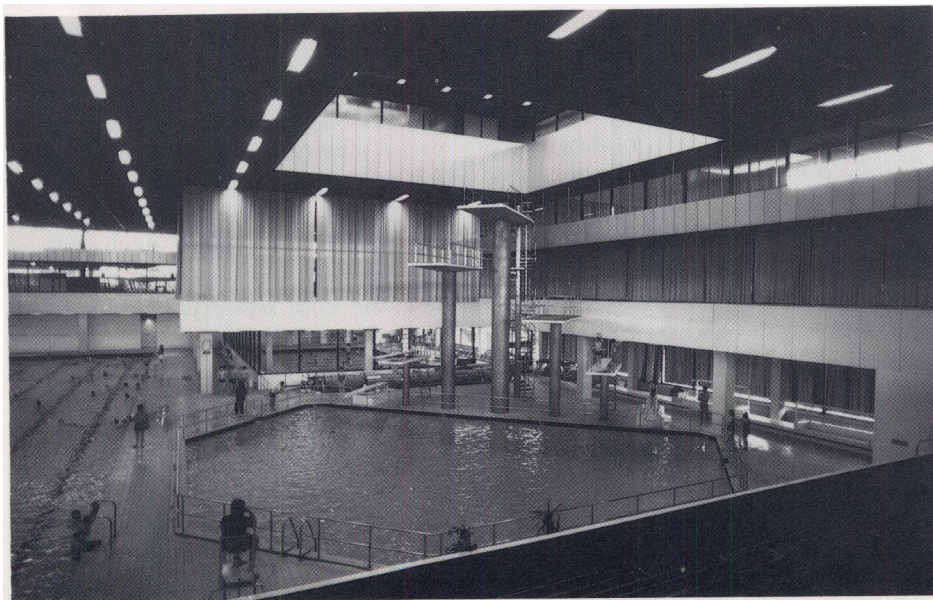
With more than 50 countries sending teams to the Games and nearly 30 of them wanting to see the events on television it needs a Host Broadcaster to provide the complex operation.

As Host Broadcaster the BBC is ultimately responsible for the facilities that will allow listeners and viewers all round the Commonwealth to keep in touch with the events. The duties of the Host Broadcaster fall into four categories:

1. producing international television pictures and effects sound from all the sports,
2. providing fully-equipped commentary positions and other facilities at those sporting venues with live television coverage,
3. providing radio and television studios plus audio and video edit suites in a purpose-built Broadcast Centre,
4. producing a daily 60-minute television programme package of highlights from the Games for transmission in Commonwealth countries in Africa, Asia, the Caribbean and Europe.

The BBC is producing the live television coverage of most of the sports. Three events are not being covered live - the shooting, the team road race in the cycling and the 30 km walk in the athletics. We are recording these events at their venues by using single camera units with on-board recorders. The recordings are brought back to the Broadcast Centre by road and there they are edited and packaged for distribution to the clients.

Live coverage is being linked back to the seven television studios and eleven radio studios inside the Broadcast Centre. Here, production teams from the BBC domestic and overseas services,



The diving pool at the RCP is being used for diving and synchronised swimming.

ABC (Australia), CBC/SRC (Canada), BCNZ (New Zealand) and the Host Broadcaster (producing the 60 minute TV package) will turn the pictures and sound into the complete programmes.

The BBC along with ABC, CBC/SRC and BCNZ are sending commentary teams to the venues with live OBs. Back at the Broadcast Centre each television production team combines their commentary from each venue with the international pictures and sound and so produce the coverage with their own national flavour. Radio production teams use their radio commentaries combined with the international sound.

In the Host Broadcaster television studio a special BBC production team will be putting together the daily 60-minute package, tailoring their presentation to suit the receiving countries.

Building the Broadcast Centre

After the Games are over, Geoff Key of PID Tel will be entering a period of heartbreak. Geoff is the Installation and Systems co-ordinator for the Host Broadcaster and has been responsible for building the Broadcast Centre and installing the BBC area at Meadowbank. When the Games are over the Broadcast Centre, which took three years to plan and build, will have its equipment removed in a matter of days, and within weeks the internal walls will be demolished. However the objectives will have been met and 500 million customers satisfied.



Geoff Key

Geoff has co-ordinated the effort of three PID Tel (formerly part of SCPD) teams each responsible for different parts of the work. Charlie McCaw of Central Systems Section is the project leader for the Central Technical Area, Gaeron Davies (O.B. Section) has overseen the installation of the radio and television studios, the radio editing suites and the off-tube commentary booths and John Harris of Recording Section has been responsible for the video tape installation at the Broadcast Centre and the BBC areas at Meadowbank including kitchens, studio and operations centre.

The Broadcast Centre is the home-from-home for the 500 overseas broadcasters visiting Edinburgh and is the base for many BBC staff during the Games. When designing the installation the teams had to take into account the needs of the client broadcasters based on their requests and on the experience of previous Commonwealth Games. The final design contains SIX television suites with space for last minute expansion, and ten radio suites. Additionally there are seven self-contained BVU (1/2" video tape) edit suites, three audio edit suites and four off-tube commentary booths. One important factor influenced the design team - the use of equipment already available. As far as possible they have avoided the cost of hiring equipment, preferring to use plant already committed to future projects or to borrow items from existing facilities. For example Television OBs in London are lending their Wimbledon routing matrix and Television Centre is sending VT machines. Many of the new items in the Centre have been bought for Type 6 OB scanners now in course of construction at Ampex, for Radio OB vehicles and to replace old equipment in the CMCCR.

It's not just technical facilities at the Broadcast Centre - there are offices, a dining room, kitchen, toilets and a conference room. Geoff has planned and supervised the construction all the way through, starting with vast open areas of a British Telecom

telephone exchange and an adjacent warehouse building. Partitioning was put in to segregate BBC and BT, then to create the rooms that have since become the working areas. By the summer of 1985 the partitioning had been finished and the power and technical cables were being laid in. The Central Technical Area installation has progressed steadily since then with most of the work having to be done on site by PID Tel engineers.

Major components for the television studios (BBC domestic, ABC, BCNZ and Host Broadcaster) were prefabricated by Link Electronics at their plant in Andover before being shipped to Edinburgh at the end of 1985. Similarly components for the radio studios were put together at the Audix factory in Saffron Walden before being moved to Scotland. The Canadian areas, two television suites and two radio studios remained empty shells until June, because the Canadians chose to ship over 16 tonnes of their Special Events kit which they would assemble themselves in Edinburgh. The BBC has supplied their studio accommodation with lighting, power, air conditioning and programme circuits to and from the CTA. The BBC also supplied the 625/50 monitors for the incoming HB vision circuits but those are the only 625-line pictures the Canadians will see. The Canadians will operate entirely on their own 525/50 standard and are using five standards converters on the HB feeds as they select them.

All the partitioning is constructed of plasterboard on a metal framing. For studios and other areas needing sound insulation a double thickness of plasterboard is fitted each side of the framing, with overlapping joints, and the void filled with rock-wool. Sound insulating ceilings are again constructed of double plasterboard, with an acoustic tile below. Fibreglass slabs pinned to the walls and covered with a light curtain give acoustic absorbency, which when supplemented by carpeting on the floor gives a very reasonable approach to professional studio standards, at a fraction of normal customer costs.

B VU edit suite for BBC English regions.

Ventilation, with chilling for television areas, is provided by air handling units, some of which may be used afterwards in local radio studios. While it has been necessary to provide dust silencer units to maintain the acoustic isolation, ductwork is of lightweight flexible material which economises in both direct and installation costs.

Although the Broadcast Centre is a substantial construction, Geoff has worked hard at keeping the costs down. As he says the studios are designed deliberately to suit the Games there's no point in building in excess luxury. For example the ventilation in the

teleVISION studios is designed to provide sufficient cooling as long as the lights are not used for long periods but it is quite adequate for presentation studios. The sound-proofing in all the studios is very good for a sports presentation studio but would obviously not be good enough for music or drama. Ventilation and sound-proofing are very expensive - we cannot afford over-engineered studios.

Our landlords, British Telecom, have been the installation controllers for power distribution to main boards, and for much of the ventilation, working in close conjunction with the BBC.

System Diagram

Over the page is an overall system diagram for the broadcasting of the XIII Commonwealth Games. It starts on the left with the sporting venues and finishes on the right with the television and radio broadcasts to the countries of the Commonwealth.

In the centre of the diagram is the Broadcast Centre containing its studios, edit suites, commentary booths and, of course, the Central Technical Area - heart of the broadcast operation.

Each venue is shown with symbols to show the type of coverage. The keys to these symbols are on the extreme left of the diagram. Most of the venues have live OBs providing the Host Broadcaster feeds of international vision and sound but some, notably the shooting venues, only have local recording of pictures and sound. Where there is a live OB there are commentary positions for both BBC and client commentators (there is no such thing as a Host Broadcaster commentary). All venues are likely to be visited by single-camera crews working for individual clients and by reporters recording their comments on portable tape recorders. The BBC domestic services have exclusive circuits from the athletics and swimming. Any facility restricted to one client (including the BBC) is described as "unilateral". Unilateral contribution circuits are coloured red on the diagram.

Live circuits through to the Broadcast Centre are indicated by continuous lines - the carriage of tape is shown by pecked lines. Live circuits go through the CTA and are distributed to the studios. Tapes from the venues are brought back to the Centre by road - HB tapes go to the Host Broadcaster suite where edited packages are made up and then distributed on line via the

Canadian technician installer Graham Campbell alongside the Betacam half-inch VT machines arranged for editing. Note the equipment built inside the flight package.