

Glasgow television Studio B vision systems installation for the BBC

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Summary The new television Studio B in Broadcasting House, Glasgow, entered operational service early in March 1982. The technical systems design and installation were carried out by a number of specialist companies under separate contracts with BBC Studio Capital Projects

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Having graduated at London University, Peter Smith joined BBC Television Outside Broadcasts in 1962. Early in 1963 he transferred to Planning and Installation (now Studio Capital Projects) Department, to assist with the conversion to 625-line operation for the BBC2 network. Since 1967 he has been involved in the systems planning and installation of colour television studios and, as a Senior Planning Engineer, is the BBC's project leader for the Glasgow Studio B project.

Department.

The vision systems contract was placed with Marconi Communication Systems and this article outlines the role of the studio and the operational and technical facilities provided under that contract.



Introduction

The provision of this new studio in Glasgow is part of a programme of replacement and updating of the BBC's regional television studios. With a floor area of 185m², the new studio is over twice the size of the Studio B previously in service. A notable feature of the project is that the major part of the technical systems design, and of the equipment supply and installation, has been carried out by specialist companies under contract to the BBC.

Design brief

Broadcasting House, Glasgow, headquarters of BBC Scotland, houses nine radio and two television studios. Television Studio A, (565m²), is used for drama and light entertainment productions, most of which are transmitted on the BBC's national networks. Studio B has been designed as a general purpose television studio with emphasis on usage for news, current affairs, sport and educational programmes. Much of this

output is intended for Scottish viewers and is usually transmitted only in Scotland, often as an alternative to the BBC1 network.

The provision of a studio specifically for the production of topical, often 'live' programmes has resulted in requirements for enhanced studio communications and integrated production areas, the accent being on mobility of personnel and information. A new custom-built block, which provides some 1800m² of additional floor space, was designed by BBC architects and built under contract to the BBC's Architectural and Civil Engineering Department.

The development provides dressing rooms and a workshop at basement level, and make-up rooms, property and drapes stores and a production lighting dimmer room on the ground floor. There is direct access at ground floor level from the studio to engineering and production management stores and to an enlarged scene dock, shared with Studio A. The first floor houses the control suite and briefing room (each with observation

windows to the studio), the technical apparatus area and an electronic maintenance room. Ventilation plant and wig and wardrobe stores are situated on the second floor.

Project implementation

Building work commenced on site early in 1979, and by mid-1980 the various ancillary areas were ready for occupation, the additional dressing rooms, make-up area etc. being required also for use with Studio A. The studio and control suite were completed in carcass pending detailed information on the technical plant installation.

Usually the design, procurement, installation and commissioning of the technical facilities are carried out by engineers from the BBC's Studio Capital Projects Department (SCPD). It became apparent during 1979 that insufficient SCPD staff were available to meet the total demand for television studio systems installation, and alternative ways of carrying out the Glasgow Studio B work would have to be found if the building was to be used effectively. Having taken soundings in industry, the BBC decided to contract out certain areas of the work to companies specializing in these fields, with SCPD providing overall co-ordination. In the event, contracts were placed covering vision, audio, studio communications, production lighting control and mechanical suspension systems. Electrical power and wiring work and the interfacing of the new studio with the BBC system in Glasgow were carried out by SCPD.

Thus, in August 1980, a contract worth over £500 000 was awarded to Marconi Communication Systems for supply and installation of the vision system facilities. Following detailed discussions regarding the technical facilities required, a timetable was agreed and produced by SCPD, in computerized PERT network form, for each of the contributions from the contractors and the BBC. These networks were interfaced to form the overall project timetable against which progress

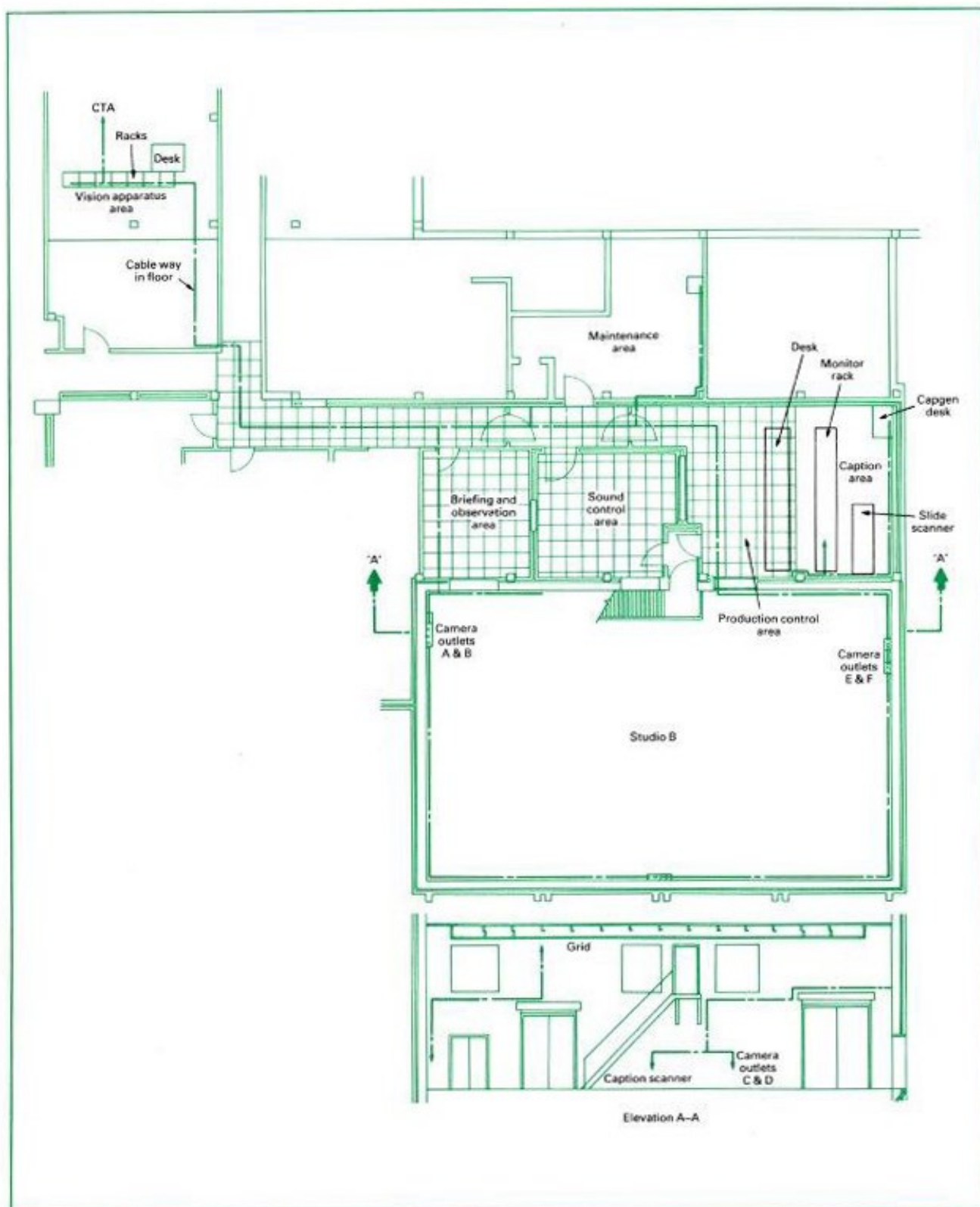


Fig. 1. Plan of Studio B Control Area

was measured. An updated bar-chart was issued monthly.

Planning of the vision system by Marconi Communication Systems proceeded apace, the basic block diagrams having been agreed by October 1980. Assembly and pre-wiring work on equipment racks began in the factory in

February 1981. Control desks and monitor stacks were also assembled at the factory, some basic testing being carried out before transportation of these items to site in June 1981. Following a three-month site installation and commissioning period, BBC technical acceptance tests started in late September. The

studio was ready for BBC operator training from early November 1981.

Vision facilities

Three Marconi Mark IX colour camera channels, each with Schneider 15:1 zoom

lenses, are provided. There are six camera cable outlets on the studio floor, with a patching panel in the Vision Apparatus Area (VAA) to enable the use of the most conveniently situated outlets for each production. A complement of floor camera cables and three custom-designed storage trolleys are also supplied. The camera mountings are to be transferred from the existing Studio B by the BBC.

A large number of video tie lines are installed between the VAA and the studio at both floor and lighting-grid levels. Many of the tie lines are fed from a field-synchronous source selection system, enabling 'in shot' switching of pictures on floor monitors. One colour and four monochrome monitors are provided for floor monitoring.

A Grass Valley 1600-2V vision mixer is provided, which has 16 input channels with pre-set, programme and two effects banks. A wide range of wipe patterns is available, together with chroma-key and downstream caption key (d.s.k) facilities. By using a separate sync pulse generator locked to studio output to drive the caption source, it is possible to insert captions on non-synchronous picture sources.

A combined production, vision and lighting control room is provided with a single control desk, housing operational positions for Secretary (SEC), Director (DIR), Vision Mixer (VM), Technical Manager (TM) and Vision Operator (VO). The profile of the desk had to be carefully designed by Marconi to accommodate the specialized control panels supplied by the various contractors involved. For the SEC and DIR positions, only communications facilities are provided. The VM position is occupied largely by the control panel for the vision mixer, together with controls for monitor source selection, caption slide selection, d.s.k source selection and colour synthesizer. The TM area houses the production lighting controls, the engineering telephone switchboard and a v.d.u./keyboard terminal of BBC supply, giving access to a computer-controlled central signal routing system for the selection of programme sources from outside the studio system. The VO position is provided with remote controls for camera electronic lift, colour balance and lens iris, together with a BBC-type colour-correction system for transparency captions and remote control of picture monitor contrast and brightness.

Facing the control desk is a monitor stack housing a total of 20 picture



Fig. 2. The control desk and monitor stack assembly for the production control room being pre-assembled at Marconi's Chelmsford factory

monitors. The left-hand section provides monitoring for production staff, all mixer picture sources being permanently displayed on 15in monochrome monitors. Two switchable preview monitors (one 15in monochrome, one 22in colour) are selectable from the control desk to the complete range of programme sources and mixer preview outputs. Dedicated monitors for d.s.k preview (12in monochrome) and studio output (22in colour) are also provided. Illuminated indication of the source displayed is provided for each monitor. A

loudspeaker carrying programme sound, a clock and miscellaneous signal lights are also built into the stack. The right-hand part of the stack is for use by the TM and VO, and incorporates two switchable 22in colour preview monitors (TM preview and VO preview) with associated waveform monitors of BBC design. A third 22in colour monitor is provided as a v.d.u for use with the production lighting control system. These monitors are trolley-mounted to enable a closer viewing distance to be achieved when required. The area above



Fig. 3. View of the production control room in operation

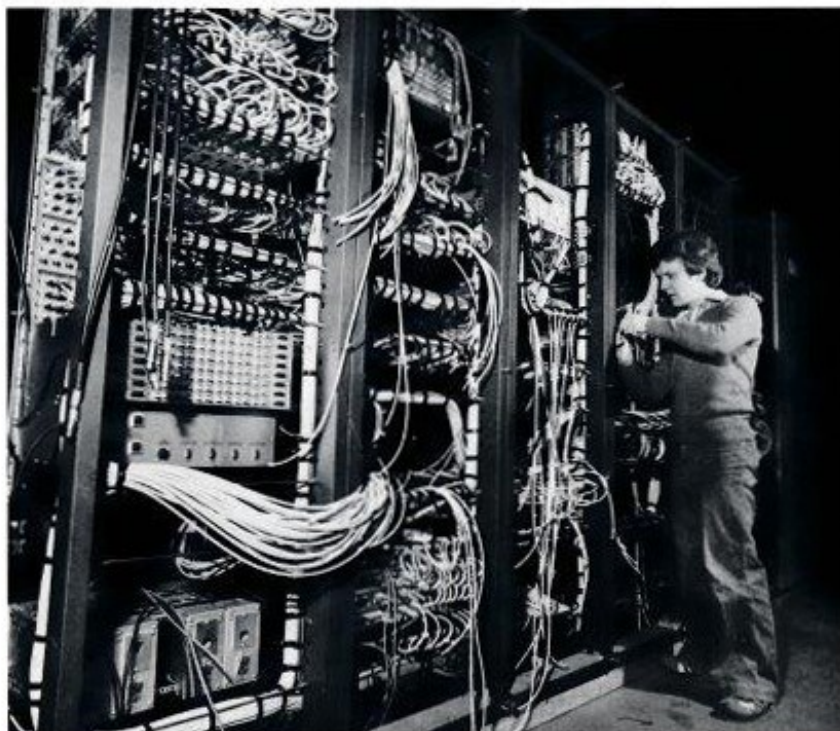


Fig. 4. Rear view of VAA racks during pre-assembly at the factory

these monitors is formed as a bridge and is occupied by the production lighting geographic mimic and metering panel, monitor source indicators, a loud-speaker, a clock and signal lights.

An area formed at the rear of the monitor stack houses caption equipment. A small desk houses a keyboard for a character generator of BBC supply, together with associated picture monitoring. The major part of the area is occupied by a dual-port colour trans-

parency caption scanner, procured and installed by the BBC. The caption area may be screened off from the rest of the control room by a folding partition.

At the back of the control room, and in full view of all picture monitors, a small console is provided for use by an editor during news and current affairs programmes. This position is provided with a switchable preview monitor (6in monochrome) and comprehensive communications facilities.



Fig. 5. The author (centre) in discussion with Alec Inglis, Technical Services Manager, BBC Scotland (right) and Don Manning the Marconi Senior Systems Engineer

A separate sound control room is situated adjacent to the production area and houses the sound-mixing desk and associated grams and tape machines. Vision facilities are limited to picture monitoring comprising two switchable preview monitors (12in monochrome) and one 13in colour monitor displaying studio output. The small monitor stand also houses illuminated indication of the picture source displayed.

Vision equipment

The technical equipment associated with the vision facilities described above is housed in the Vision Apparatus Area. This is situated adjacent to the Central Technical Area (CTA) and is about 50m from the Studio B control suite. A single row of seven equipment racks is installed with a small monitoring console at one end of the row.

The Mark IX CCUs, together with rack-mounted monochrome picture and waveform monitors, are installed in cabinets adjacent to the monitoring console. The console houses two switchable preview monitors (22in colour) and associated source selection controls, forming a camera line-up position with the adjacent racks. A novel feature of this position is the ability to display on one colour monitor a horizontally or vertically split picture comprising any two of the three camera outputs. This facility is particularly useful when matching the cameras during line-up.

A rack in the centre of the row houses the PAL coders for cameras, captions and colour bars, together with a comprehensive studio measurement position. A Tektronix R521 vectorscope, 1481R waveform monitor and a 12in monochrome monitor are provided, selectable to all vision sources. Additionally, the waveform monitor has access to pulses and colour subcarrier. The measuring facilities are based on a BBC-designed amplitude-measuring unit, supplied on embodiment loan to Marconi. This unit facilitates the amplitude measurement of signals by a null method and produces a numerical display of the deviation from zero level.

All signal switching of picture sources to picture or waveform monitors is undertaken by a 32 x 16 Grass Valley Type 400 switching matrix. This equipment uses a microprocessor-based control system and offers conventional button-per-crosspoint control or keypad control. The VAA and sound-control selectors are of the conventional type, as

rapid re-selection is a requirement in these areas. The production and vision/lighting control room is equipped throughout with keypad controls, effecting a substantial saving in panel space which is at a premium in this area. All signal switching occurs during the field interval, enabling rapid re-selection of synchronous sources without disturbance to the displayed picture. As part of the Glasgow CTA redevelopment currently being carried out by the BBC, the pulse distribution system has been modernized. The CTA now distributes a 'colour black' signal (black level and burst) to all picture origination areas. Each of these areas is provided with a sync pulse generator (s.p.g) which is locked to the incoming colour black signal and regenerates the discrete pulses and colour subcarrier. Signal timing of any one area as a whole is adjusted using a line-phasing control on the s.p.g. In order to obtain accurate colour phasing of outside sources into the studio mixer, 'isophasing' equipment is installed in each incoming circuit. This is, in effect, a variable delay line which adjusts itself such that the source passing through is always in phase with a reference signal derived from the s.p.g. The s.p.g, isophasing equipment and associated controls were supplied by the BBC on embodiment load.

Conclusion

Glasgow Studio B is the third television studio systems installation to be contracted out by the BBC. The successful completion of the project is largely due to the general atmosphere of co-operation on both sides. Staff in BBC Scotland accepted that certain facilities would not be custom-built and that in some cases operational techniques might be unfamiliar to them. Conversely, the contractors had to come to terms with the BBC's need to achieve a degree of uniformity between installations to avoid undue staff training difficulties.



Fig. 6. View of the Vision Apparatus Area in operation in Studio B



Fig. 7. General view of the studio floor

After being accepted by the BBC from the contractors, new Studio B was used for crew training until going into full operational service early in March 1982.

Acknowledgements

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RÉSUMÉ

Le nouveau studio de télévision B de Broadcasting House à Glasgow est entré en service début mars 1982. La conception et l'installation des systèmes techniques ont été réalisées par plusieurs sociétés spécialisées sous contrats particuliers avec le service des grands projets de studios de la BBC.

Le contrat pour les systèmes relatifs à l'image a été passé avec Marconi Communication Systems Limited. Cet article définit la fonction du studio et décrit les installations de contrôle et installations techniques fournies en vertu de ce contrat.

ZUSAMMENFASSUNG

Das neue Fernsehstudio B im Glasgower Broadcasting House wurde Anfang März 1982 in Betrieb genommen. Die Ausführung und Installation der technischen Systeme erfolgte durch eine Reihe von spezialisierten Firmen unter gesonderten Verträgen mit der BBC-Studioabteilung für Grossbauprojekte.

Der Auftrag für die Bildsysteme ging an die Marconi Communication Systems Limited, und in diesem Artikel wird nun die Rolle des Studios und die im Rahmen dieses Vertrags bereitgestellten betrieblichen und technischen Einrichtungen erläutert.

RESUMEN

El nuevo Estudio B de televisión en la Broadcasting House, Glasgow, entró en servicio funcional a principios de marzo de 1982. El diseño e instalación de los sistemas técnicos fueron realizados por varias compañías especializadas bajo contratos separados con el departamento de proyectos capitales de estudios de la BBC.

El contrato de los sistemas de visión fue celebrado con Marconi Communication Systems Limited y este artículo resume el papel a desempeñar del estudio y los medios funcionales y técnicos suministrados bajo dicho contrato.