

ENGINEERING

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✿ Queen's Award presented



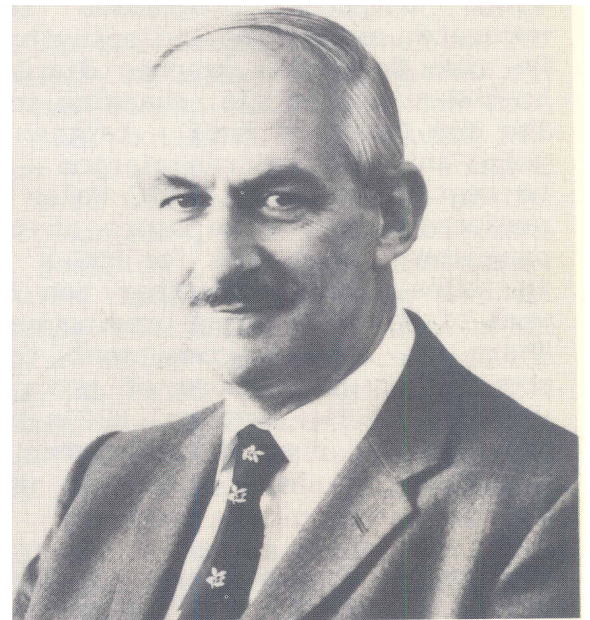
At a recent ceremony at Kingswood Warren the Director of Engineering, Bill Denny, received the Queen's Award to Industry for Technological Achievement on behalf of Engineering Division from Her Majesty's Lord-Lieutenant of the County of Surrey, Richard E. Thornton OBE, J.P. He was accompanied by Director General, Michael Checkland, Deputy Director of Engineering, Charles Sandbank and the Head of Research Department, Dr Bruce Moffat.

BBC to give annual IEE Faraday Lectures

BBC Engineering has been invited by the Institute of Electrical Engineers to present the annual Faraday Lectures. The Lectures, which are aimed at 16-18 year olds, visit seventeen different locations in the UK and Ireland, in the period from September 1988 to March 1989.

John Brooks, who has just retired as Assistant Head of Engineering Training Department, has been appointed Project Leader, and Alan Lafferty (EID) has been nominated as Tour Manager.

SMPTE Award



Michael Stickler, Deputy Head of P & ID Tel has been elected a Fellow of the Society of Motion Picture and Television Engineers (SMPTE) in recognition of his work with remote control and digital video interface standards. For the last few years Mike has been Chairman of the European Broadcasting Union (EBU) Committees which, in close collaboration with the SMPTE, have investigated and agreed the international standards for the remote control and digital video interface of television production equipment. These have resulted in the agreements contained in EBU Technical Documents 3245 for remote control systems and 3246/7 for the parallel and serial interfaces.

Michael, who has been an engineer in the BBC since 1953, received the Fellowship from M. Carlos Kennedy, President of the SMPTE during the Society's recent 129th Technical Conference in Los Angeles.

New graphics area for Cardiff

"Children in Need", on Friday 27 November, gave BBC Wales a golden opportunity to try out their new £280,000 electronic graphics area for the first time in earnest. And, according to Senior Graphic Designer (Wales), Clive Gould:

"The operation worked most successfully. Various graphic images were created using Paintbox and these, along with Slidefile, were made available as sources to the gallery in Studio C1. One of the most important contributions from the Graphics Area was provided by Car I Blundell who wrote computer programmes for eight separate animations, displaying totals. He also devised a graphic display of up-to-the-minute totals, changing in-vision. The new Graphics Area - baptism of fire, going into live transmission - proved to be most successful". BBC Wales currently produces around nine hours of television programmes each week for BBC 1 and BBC 2 in Wales, plus a further ten hours per week of Welsh language programmes for S4C. There is also a commitment to provide about sixty-nine hours of programmes per year to the two national BBC networks, in addition to special programmes such as "Children in Need", General Elections, etc.

The graphics department at Broadcasting House, Llandaff, is split into four groups:

News, Current Affairs and Sport Presentation
General Programmes
Childrens Programmes

To service these groups, Clive has the following staff working to him: five Graphic Designers; six Graphic Design Assistants; seven Graphic Assistants; one Photographic Technician; one Illustrator; one Graphics Clerk and, of course, the aforementioned Car I Blundell who is the Computer Graphics Programmer/Designer.

The Graphics Area is located on the first floor of Broadcasting House, at the north-west end of the building, above studio C2. Previously, the area relied on "cardboard engineering" techniques to produce graphics, augmented by two Acorn Cambridge Workstations driving Prisma 2 and Prisma 3 frame buffers, to provide "real time"

graphics, captions etc.

After about seven months of re-furbishment, the up-dated Graphics Area now contains a Quantel Paintbox, a Sany CCD Colour Camera (DXC3000), an Aston 3B Character Generator and the BBC Slidefile/Artfile system manufactured by Rank Cintel Ltd. There is also a new character generator area in a separate room, adjacent to the main area. The Acorn workstations from the previous set-up have been retained and are now tied in with the new Graphics Area.

The project was constructed by P&ID Tel. under the supervision of Bob Head. Working with him were Technicians, John MacDonald and Andy Belcher, along with Wiremen, Alan Choe and Graham Jardine. The following technical description of the new Graphics **Continued on Page 10**

Licence Agreement

A manufacturing licence for the Dynamic **Carrier Control Limit: IBJ Amplifier, AM6/30**, has been agreed with Marconi Communication Systems Ltd of Chelmsford. This unit allows the level of the transmitter output to be actively adjusted according to the programme content, whilst maintaining the modulation index. Because virtually all a.m. receivers include an a. g. c. circuit, this technique, known correctly as AM Compression, is unlikely to result in a perceptible degradation of the receive signal quality. The system was described in greater detail in the IBC '86 issue of Eng. Inf., (Number 26.)

Transmitter News

The following transmitters have opened or changed since October:

UHF Television
Barrow -in-Furness
Cowling
Hastings
Hereford
Lumphanan
The Bournes
Voe

Cumbria
N. Yorks
E. Sussex
Hereford
Grampian
Surrey
Shetland

VHF Radio
Crystal Palace
High Wycombe

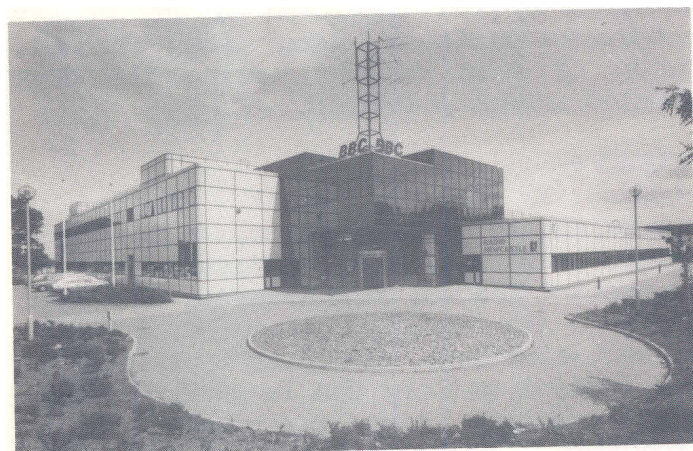
R1 (Temp)
Bucks

Note: The R4 low-frequency transmitters at Droitwich, Burghhead and Westerglen will change to 198kHz on 1st February 1988.

Newcastle move to new Broadcasting Centre

By Nick sharwoOd-Smith

If the world of Broadcasting seems to be a changing place today, in terms of programmes and technical innovation it always has been. But in terms of resources and administration policy, there have been remarkable changes since the previous article in Eng. Inf. on the construction of the new Broadcasting Centre in Newcastle. Housing both regional TV and Local Radio staff, and occupying a green field site, the building offered the opportunity to create a centre for programme making which would set the working environment for well into the next decade and beyond. The BBC's production needs have altered since the project was first conceived and a certain amount of re-thinking has become necessary as the work progressed. The work has not been all in the hands of P&ID Tel, with contracts for installation and equipment supply going to Marconi (studio vision systems), Calrec (sound desks) and Philip Drake (talkback and intercan systems).



Newcastle Broadcasting Centre

Links with Carlisle have become less important now that the Centre has been joined by Leeds and five Local Radio stations to form the new North East region. Regional ties have been strengthened by moving TV and Radio together from their previously separate, cramped accommodation. Joint Newsrooms, with shared intake facilities, have been designed to cater for regional and local output as well as network TV and Radio. The demise of the Link 130 cameras has meant that the new TV studios have been held up, awaiting delivery of substitute Ikegami cameras and control units, and the old studios have had to support regional programming for longer than anticipated.

Radio Newcastle moved into the building first and were soon able to offer network radio a regular facility by supporting a monthly edition of Wanan's Hour. TV were not far behind with, Administration staff and then, when delivery of the five Ikegami cameras took place, operational training at the end of September. A variety of work for children's programmes began with recordings of Jackanory, quizzes and a location drama; the latter utilises the station's Renault Espace van equipped for use as a PSC unit while quizzes use the audience facility in Studio A.

STUDIO A

Studio A is the larger of the two TV Studios, occupying some 240 sq metres and the full two storey height of the main part of the building. Having no observation windows to the control gallery, best use has been made of the available floorspace, with no restrictions on the position of the cyclorama. Equipped with three full-facility Ikegami 323K cameras, and able to handle up to five cameras using Triaxial cable, the studio is designed for drama, light entertainment and audience participation programmes. A tiered seating system can be brought into the studio on "hover trollies" - floating a fraction of an inch off the ground - and assembled in three sections to seat 116 people.

The studio's two longer walls accommodate four wallboxes carrying vision and sound circuits, including talkback and programme feeds, to and from the external technical areas. Adjacent to each is a camera connection box and a variety of switched and unswitched mains outlets. Audio and video tie-lines have been extended from the wallboxes to the TV and Local Radio apparatus rooms. Fifty-six low level microphone circuits go to the sound control room and twenty-eight to the Local Radio, Studio 2 cubicle. Provision has thus been made to use this large acoustically treated area for more ambitious productions in Radio as well as in Television; Radio Newcastle have already used it for recording a Brass Band programme.

Above the studio floor is a twelve track lighting grid, with five motorised pantographs on each track. The sixty

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motorised sources are complemented by lamps on a fixed peripheral track, and a number of short overhead lighting bars. These are designed to move transversally between unextended motorised luminaires and can accommodate extra light sources to fulfill the most specific lighting requirements. A dual source "Giano" luminaire is suspended from each of the motorised Pantographs. A sophisticated remote control enables the lighting director to use a "wireless" hand-held keypad to move lights and identify them from the vantage point of the studio floor, thus, allowing shorter setting-up times.

Twenty-four "Iris 2" soft-source luminaires are peripherally mounted on manual Pantographs for general cyclorama illumination and these can be augmented by twenty-four Orion 4 groundrow fills at the base of the cyc. The peripheral fixed-track has space for a further twelve "Pollux" spotlights evenly distributed round the studio. Control of the lighting is from the desk in the Production Gallery which seats the Director, T.M., Vision Operator and Production Assistant, in line opposite the monitor stack. The sound staff occupy a cubicle situated behind the main desk, acoustically separated from the main area but with an observation window to facilitate visual communication.

A Cox T16-1 Mixer forms the heart of the vision system, having a single effects bank, downstream keyer and some ninety-nine wipe patterns. The downstream keyer has variable edging and colour fill, and the CSO effects are augmented by two BBC soft-edge split-screen switches (MXSM/S04). The latter appear as inputs to the desk together with: six outside sources (locally selectable from a twenty-four input Probel Matrix); five cameras; a Slidefile stills-store and an Aston 3 character generator. A local selector can be used to route anyone of eight sources to the key inputs of these switches, and anyone of sixteen sources to each of the foreground and background inputs. A Questech Charisma digital video effects unit is likely to be added for use both in studio A and elsewhere on station.

Control of the studio lighting is from a Rank Strand "Gemini" board. This supervises the working of one hundred and twenty 5kW dimmers in the switching room, via a memory system with instant recall

using the Gemini's control keypad. A disc-drive allows individual effects or sequences to be stored for later use. Any of the studio's dimmers can be allocated, singly or jointly, to any of the channels on the control board. A colour VDU dedicated to the Gemini gives a constant read-out indicating channel and group status. A desk top mimic, using incandescent lights fed from the output of the individual dimmers, shows the relative output voltage of the feeds in their correct geographical location in the studio. As well as complex fades and mixes, the control system includes a programme effects generator for producing "Disco" lighting.

In the Sound Control room is a 28-channel, 4-group stereo Calrec desk. Each channel has multi-band equalisation, with four auxiliary outputs for foldback, as well as dual echo sends and a separate PA output. There is also a simple eight-channel sutmixer on the upper part of the desk, designated the "audience mixer", allowing live studio effects to be derived without using up valuable space on the fully equipped section. Dynamic control is provided by the insertion of any of six compressor/limiters into the channel, group or main outputs, using the desk mounted insert jackfield.

STUDIO B

Studio B is a small studio of approximately 30 sq metres, without the headroom of studio A, equipped with two lightweight Ikegami 323P cameras. Although designed for "self-op" use with a mobile Presentation Desk, the full facilities of the control gallery can be used to allow more exacting live programmes to be broadcast. Post production work is also envisaged here and a window has been provided to allow visual communication between the studio and the gallery, where sound control and vision control occupy the same room.

A single wallbox in the studio carries video and audio tie lines, together with ten low level microphone circuits, to the gallery. A basic lighting grid, composed of sliding and fixed bars, offers suspension for the luminaires. These can be connected to any of the twenty outlets round the ceiling, two of which are fed from each of the studio's ten 5kW dimmers. Control of the dimmers is by quadrant faders (plus a master), with a special circuit which allows the Presenter to operate "production lights ON and

houselights OFF" at the press of a single button.

The masterswitch is on the Calrec Presentation Desk which, together with two trolley-mounted monitor stacks and a caption desk, form a semi-permanent fixture in the studio. It is a standard unit with a set of ergonomically designed controls, giving it the superficial appearance of being manufactured by Fisher-Price! It is intended to be used with a locked-off camera and minimal engineering assistance to produce spots into BBC1 or BBC2 for Breakfast Time and regional News bulletins. The adjacent caption desk allows local control of the Aston caption generator and associated overlay effects unit, via a remote keyboard connector and Probel selection matrix.

SYNTHESIS FACILITIES

In addition to acting as gallery for live broadcasting in studio B, the control area is equipped to be used for post-production work, specifically as a Synthesizer suite for re-recording and enhancing video sound. Mounted in the bays behind the Calrec 12-channel, a-group sound desk is a Sony Hi-Band U-Matic videotape machine, which can be linked by tie lines to any of the video areas. An Audio Kinetics Q-Lock synchroniser is being used to link the Sony with Otari MC70 eight-track and Studer twin-track audio tape machines using recorded timecode information. A completed mix, compiled using tape, cart, disc or speech originating in the studio, will then be recorded back onto the master video machine.

The Calrec desk is equipped with bargraph metering on all eight groups. A master mic/line switch allows easy interface with the Otari, whether in recording or mixdown mode. The tape machine remote control box and the control keypad for the Q-Lock synchroniser are both situated on umbilicals to the right hand side of the desk and Dolby A has been provided for the eight track. Two digital reverb devices have been provided - a Lexicon PCM 60, which offers a selection of reverberation times with "plate" or "room" characteristics, and an AMS delay line, capable of being user-programmed for more variable effects.

There are on-line video facilities for both 1" and 3/4" formats, with another three rooms designated as off-line PSC Editing

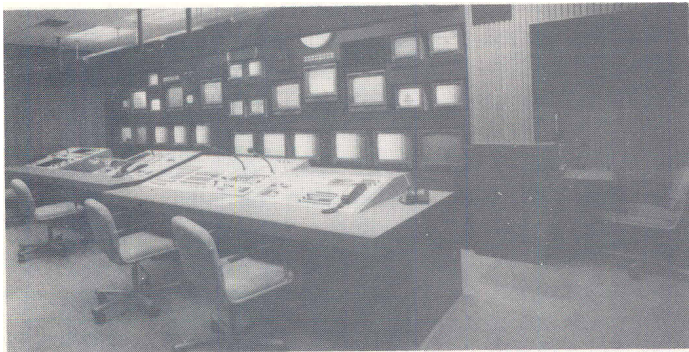
Cubicles; two of these sandwich an acoustically treated voice booth. Each of the off-line rooms contains a pair of Sany U-Matic video-tape machines and a four-channel audio-mixer, linked to allow basic editing and audio dubbing.

The PSC on-line cubicles are designated vr1 and vr2 and, like the off-line areas, contain a pair of Sany U-Matic machines and a four channel audio mixer. They are also equipped with the necessary switching and communications facilities to enable them to replay tapes for transmission. A Master Mode switch has been installed in order to set the whole cubicle into either Transmit or Edit mode. A single button activates a multi-level switch which will configure the cubicle for the least possible picture degradation in Edit mode and the maximum fail-safe provision in Transmission mode. The facilities for 1" editing and transmission are provided by two pairs of Sany C-Format machines in Cubicles vr3 and vr4. These areas are equipped with similar communications, record and replay capabilities to those in vrs 1 & 2. Should three-machine editing be needed, then the Edit Control room, vrs, can be used. The equipment in this area is capable of much more complex editing, using a Cox Television mixer, to take inputs from either of the PSC On-line cubicles, or from the 1" cubicles, and record onto either of the 1" machines vr3B or vr4B. Other inputs to the mixer are from the Slidefile stills-store, a local video clock, and an Aston caption generator. The recording process can be done manually, or under the supervision of a Sany BVE900 edit controller working with the video timecode information. To aid this interface, the Television mixer has a Memory Control Effects (MCE) facility which enables up to 64 complete configurations of control Panel settings to be stored and recalled.

GRAPHICS FACILITIES

In the same corridor as the PSC Edit cubicles is the Graphics Area. Here; the desk contains the controls for the Rank Cintel/BBC Slidefile, the Aston 3 caption generator and the tablet for the Slidefile's additional processor Artfile. The Slidefile/Artfile system has inputs from: a local tk machine or BA 10 (for capturing stills) caption scanner; the Aston; a camera in each studio and an RGB decoded feed from a 24-way Probel selector. A Sony auto-rostrum camera is also available, adjacent to the tk
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Newcastle Studio A gallery

machine. Control of this equipment can be remotod to various parts of the building fran the Graphics desk. When local control is kept for live broadcasting, there are comprehensive talkback and intercom facilities for communicating with the studios and other technical areas. Artfile is the primary source of graphics origination in the studio centre and a second Slidefile processor is available in the Design Office, to allow work on longer projects without interruption to on-air cxxnmitments.

TECHNICAL APPARATUS~

At the centre of the building is the Technical Apparatus Room (TAR). Here, some fifty bays deal with control, monitoring, routing and line-up of the

station's circuits. The technical monitoring position, where sound and vision can be assessed, features a comprehensive range of internal and external communications facilities. There is also a camera line-up position and a bay where the fifteen camera points round the building can be cross plugged to the relevant camera control unit.

WCAL RADIO

The Radio Newcastle facilities are centred on a small studio 1, adjoined by two Presenter-operated cubicles which contain BBC Mk 3 stereo desks. In addition the News team have a small L-shaped studio and there is a 45sq m studio 2. The cubicle here is equipped with two sound desks - a BBC Mk 3 and a 24-channel, 8-group Chilton, designed for coping with quiz shows, audience shows, groups of musicians and the compilation of other more complex programmes. Should the studio fail to provide sufficient space, other possibilities are available: the Reception area has been pressed into service as a venue and the lines through to TV studio A include a ccrv link for monitoring Radio recordings.

The Newcastle Broadcasting centre that has emerged after years of planning and much engineering endeavour, is shaping up as a responsive and versatile production tool.

Southampton Alight

An unconventional answer was suggested by P & ID Tel. - use fluorescent tubes, close to the bottom of the cyclorama cloth.

This would release floor space, and the increased efficiency of tubes over tungsten lighting would reduce the power and ventilation requirement to manageable proportions. A tube with a suitable modern phosphor should have a bright light output and larger Persistence.

Engineering staff at Southampton took up the challenge and discovered that high efficiency tubes did have a long Persistence and flicker is not a problem. The real problem was designing a reflector which gave the correct gradation of light up the cyclorama cloth.

Southampton has the BBC's only five sided TV studio, and it has severe limitations in space, lighting, power availability, and ventilation.

The recent design brief to introduce a new set, calling for bottom lighting of the cyclorama, looked impossible to meet on all three counts: even if there was the power, there is no room for the conventional Palace Island.

The final design involves banks of four tubes and a reflector which is an unlikely hexagonal shape. The light unit can literally touch the cyclorama cloth and have a coving immediately behind it - only 18 inches out from the cloth.