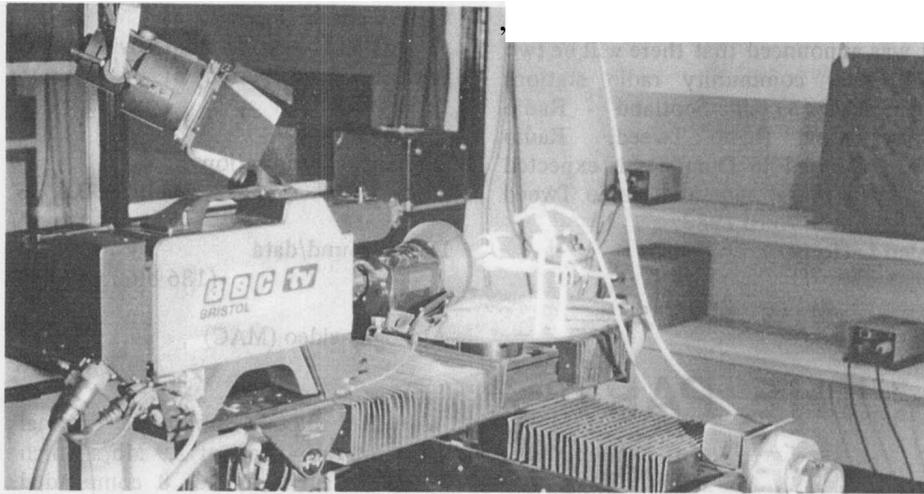


ENG INF

The Quarterly for BBC Engineering Staff



BRISTOL'S NEW BENCH



The new macro-bench at Bristol is put to good use studying a plant specimen.

Engineers at the Bristol NPC have developed a new facility in the world of macro-photography. The new facility known as a "macro bench", has been developed in co-operation with the Natural History Unit, and its introduction coincided with the Unit's twenty fifth anniversary, earlier this year.

In the world of entomology and botany, the problems of televising small objects at magnification of more than x1, requires special attention. The "macrobench" overcomes many of the problems. The new facility comprises two parts, the bench itself, and a purpose-built control desk.

The macro-bench, which can be used in a conventional studio/laboratory or on field location, comprises a mounting platform on which the object sits, a camera support column, and special "cold" lighting. The mounting platform can be rotated through a complete circle in either direction, moved towards, away and across the camera, or can be raised or lowered to any height. Control of the platform is effected via servo-motors manufactured specially for the bench, and the associated control panel; DC motors have been used for this purpose, since stepping motors would have caused undue vibration.

Machined screws allow precise

and accurate positioning of the platform; these have been covered with bellows to prevent water and insects entering. There are no conventional "frames" with the platform, although these can be provided if necessary. Mounting holes have been provided so that standard laboratory clamps can be used to hold specimens in position. The camera support has been manufactured from a modified Vinten "wind-up" column, fitted with a platform to take a standard pan and tilt head. The bench has been designed to allow the use of broadcast quality cameras such as the Ikegami 79 D television camera, fitted with either a Canon 10:1 zoom lens with x2 adaptor, or a Zeiss Tessovar microscope with four different turrets with overlapping ranges and a 4:1 zoom facility; this allows magnifications in the range of 1/2 to 22 times. The camera mount also allows film cameras to be fitted.

Two types of "cold" lighting have been provided. Under conventional lights the heat is too great for small insects, and plants would quickly dry up. Therefore, 200 watt HMI lights provide the main source, with the addition of ACMI 300 watt mercury discharge lamps feeding illumination down fibre optic light guides for more 'continued on Page 8'

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Editoria.'

BBC Microcomputer

Much of the fuss caused by the late deliveries of Acorn's "BBC Micro-computer" has died down, as engineers and enthusiasts alike discover the delights of this most versatile machine. Visiting Specialist and Operational Departments, as I often do, I am pleasantly surprised at the number of micros being put to good engineering use. There will always be those who are more interested in "Space Invaders" and "Pacman", but here, at last, is evidence of the computer's use as a tool; it has clearly taken over where the HP35 left off.

Whilst on the subject of computers, it occurs to me that some departments may be sitting on a pile of useful programs that may have value and application elsewhere in Engineering Division. If they would like to let me know what sort of software is available, I will endeavour to publish a summary in "Eng Inf".

Also on the subject of home computers, are there any radio-amateurs who are also computer enthusiasts? An unlikely combination, since both hobbies can be absorbing and time-consuming; however, if there are any dual hobbyists around, I would be very pleased to hear from them.

Transmitters

The planning, construction and operation of radio and television transmission links goes on almost unnoticed. The licence payers notice however, particularly, when things go wrong. How pleasant it is, therefore, to publish this letter from Philip Birdshall, a listener in Truro: "I would like you to know how much I appreciate the improved sound quality of Radio Four now available on VHF in Cornwall". Congratulations to all concerned with the installation of the PCM link to North Hessary Tor.

Engineering Ties

For those who have ordered an Engineering Division tie (see Eng Inf number 10), they will be delivered soon. If anyone else would like one, we can place another order if demand warrants it. Please let me know the colour (blue or maroon) and quantity; send no money, we will invoice you when they arrive.

Thank: ~'OU

My thanks to the many engineers and staff who, throughout the year, have contributed articles for Eng Inf, or have taken the time and trouble to show me some new, unpublicised, engineering features. To others who may be involved in Research, Design, Installation, Operations or Maintenance, have you a story to tell? Let me know by ringing Alan Lafferty LBH 5432 or writing to 701 HWH.

Late addition

Just as we were going to press, it was announced that there will be two additional community radio stations (see page 3), in Scotland - Radio Solway and Radio Tweed. Radio Solway based in Dumfries is expected to open in January and Radio Tweed in Selkirk in April 1983.

Alan Lafferty



THE PART REPORT

On November 30th, The Home Secretary announced that he accepted the recommendations of the Part Committee that the VK DBS services should use the C-MAC transmission proposed by the IBA.

The BBC's position was that, although the C-MAC system would be satisfactory from a technical point of view, the adoption of C-MAC would inevitably have an adverse effect on the financial viability of our DBS services. In particular, it seems unlikely to become a European standard and consequently we would lose potential income from overseas subscribers. There was also considerable concern that the receivers for C-MAC would be significantly more expensive and that this could inhibit the growth of the DBS audience. Evidence to the Part Committee by receiver manufacturers indicated that they were convinced that C-MAC receivers would not be significantly more expensive. Previous experience with manufacturer's costs (e.g. for teletext) casts doubt on this.

The financial viability of, the DBS services is crucial to the BBC. The Government accepted that the DBS services should be self-financing and that any surplus should be used to help the general finances of the BBC. As the financial prospects for the DBS

services are seen to be less favourable as a result of the Pan Repan and the Hum Report on cable expansion, the BBC has seriously considered withdrawal of its proposals for DBS services.

However, subject to the satisfactory conclusion of negotiations with Unisat, the satellite contractors and a reappraisal of the financial situation, it has been decided that the BBC should go ahead with its plans for DBS, using C-MAC as the transmission standard.

The BBC has been liaising with the IBA to agree an outline specification for the C-MAC system.

C-MAC (Brief Description)

The C-MAC system divides each television line period of 64 MS into three parts:

Digital synchronisation (8 bits) 0.4 MS

Digital sound/data (186 bits) 9.18 MS

Analogue video (MAC) 54.42 MS

The digital sound/data channel has a bit rate of about 2.9 Mb/s which would be sufficient for 8 compressed sound channels using the 'structure map' technique recommended by the Part Committee. (The structure map is an index to define the location of a specific sound or data service within the digital bit-stream).

The digital signals employ a form of phase-shift keying known as 2A PSK.

The video signal comprises, on each line, a chrominance signal followed by a luminance signal. The chrominance information is transmitted as alternative lines of U and V. The odd numbered lines are U lines and the even numbered lines are V lines. The sequence thus repeats after 2 fields compared with 8 fields for PAL. However, the transmission of information on alternate lines reduces the vertical resolution of chrominance signals by a factor of about two, compared with PAL.

The chrominance and luminance signals are compressed in time in the ratios of 3:1 and 3:2 respectively. The equivalent bandwidth of the uncompressed signals is 5.6 MHz for luminance and 1.6 MHz for chrominance.

The RF carrier is frequency-modulated by the video signal during the active line period and digitally modulated during the sound/data period.



COMMUNITY RADIO STUDIOS

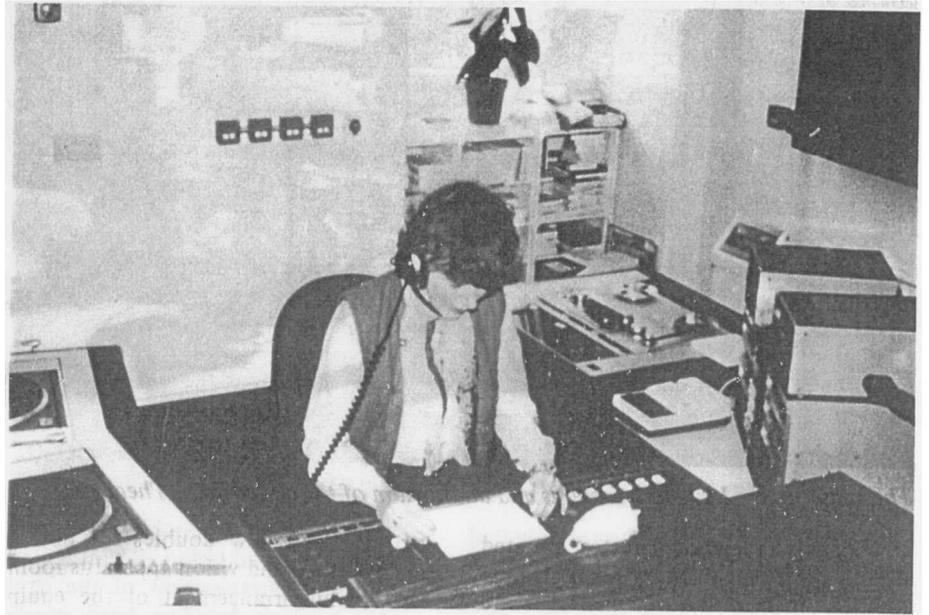
Over the past five years the BBC has set up a total of eight Community Stations throughout the British Isles and has plans for a further 20 or so to be set up over the next five years.

The first two Community Stations began broadcasting to the Orkney and Shetland Islands in May 1977. Further stations have been set up at Radio Nan Eilean (Stornoway) - a Gaelic-speaking station which opts out of Radio Highlands - and at Radio Clwyd (Mold) which opts out of Radio Wales. These stations are under the jurisdiction of the Controllers of the National Regions involved. Four more have been brought into service in 1982. These were Radio Guernsey and Radio Jersey, which independently opt-out of the Radio 2 mf service for the Channel Islands, Radio Furness (Barrow) which opts-out of the Local Radio Cumbria mf and vhf services, as well as a studio in Taunton (Somerset Studio) which contributes to Local Radio Bristol. The Local Radio stations come under the jurisdiction of Controller, Local Radio.

Most of the Community Stations have only four staff - a senior producer or manager, two producer/reporters and a secretary/receptionist. There is no engineer. Engineering maintenance is arranged locally to provide the most efficient cover. The ultimate responsibility for the stations in the National Regions is Manager Communications and Engineering Services (MCES), and for those associated with Local Radio, Head of Engineering, Local Radio, (H.Eng.LR.).

The self-operate studio area has a 12-channel stereo broadcast/control desk which includes two built-in gramophone turntables, two mono tape machines, one 3-stack and one single-stack cartridge machine, an acoustic talks table with two microphones and a telephone switchboard to allow the broadcasting of telephone calls.

The mixer has 12 faders, each of which normally controls one permanent source: they all have the ability to select at least one alternative source for occasional use. They are laid out with slider faders in two groups of six with a script space between. Each channel has a button to 'prefade' the source so that it can be heard on headphones and the level measured on the prefade PPM before the fader is opened. There is also a preset gain control to adjust the level so that when the source is faded up the fader can be brought fully open and the correct level obtained without further adjustment. The two gramophone turntables start automatically as soon as the



The Orkney community radio station

appropriate fader is moved from its 'off position' - i.e. remote start - as do the two tape machines, when they are set to the 'remote start' position. The two telephone channels allow two telephone calls to be mixed with the other sources for broadcasting. Anyone of the five telephone circuits can be selected via keys on the panel to the right of the faders to either of the two channels. There is a special unit called a Telephone Balance Unit mounted on the apparatus bay which acts as the interface between the public telephone network and the BBC equipment.

The sustaining service channel is always fed with the main programme normally carried by the local transmitter. This fader is used when the broadcaster is leaving or joining the main programme in conjunction with the 'opt-out' control.

The opt-out control is situated above the left-hand group of six channels. This consists of an 'ignition key' type switch which when operated enables another key to put the control desk into the transmission chain to the transmitter. The sustaining service is then faded down and the local programme broadcast.

Two cartridge machines allow NAB cartridges to be replayed. One is a single-stack record/replay machine, used for the production of jingles and tracks. The other is a three-stack replay-only machine, fitted with a circuit that selects one of the three outputs.

The three microphone channels are arranged such that Mic 1 is the main broadcaster's microphone and this is fixed to the end of a movable

supporting arm attached to the control desk. The other two microphones are for contributors' use and are mounted on microphone stands used with the talks table.

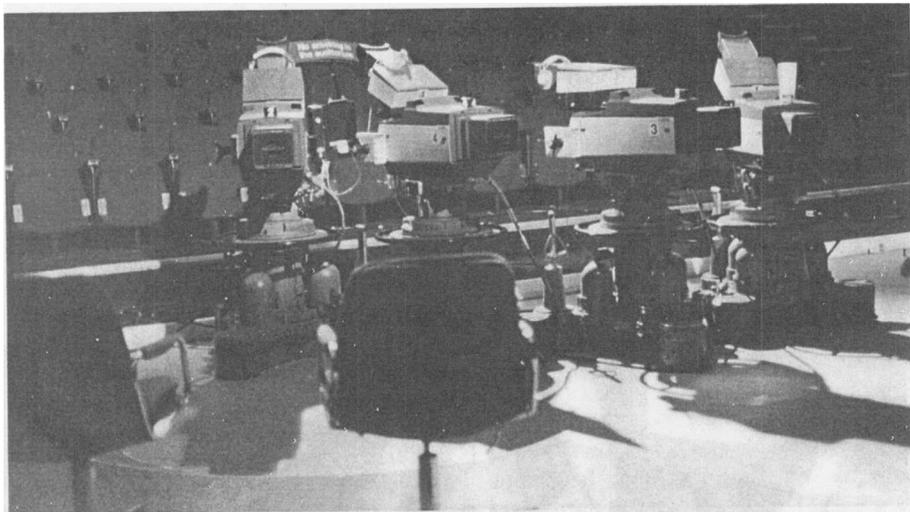
The station is provided with a simple 5-position intercom for instantaneous communication. The control desk has a panel to the right-hand side of the mixer fitted with five keys and associated indication lamps which will communicate with: the secretary/receptionist; the producer; the reporter; the senior producer/manager; the engineering room.

Each broadcaster is issued with one battery-operated portable tape recorder and microphone which are used to produce recordings of interviews with the local people in the community. The batteries are rechargeable accumulators which are charged overnight in the office.

There is one bulk tape eraser provided which will erase tape reels and cartridges in a few seconds.

None of the community stations actually broadcasts in stereo. However, the control desk provided has stereo facilities fitted to all the channels (except microphones). This was a deliberate policy decision since the additional initial cost is small, and more importantly, if a station were to be required to broadcast in stereo at a later stage only stereo tape machines and a few additional amplifiers would be required. Most importantly, these can be provided and installed without the main control desk being removed from service, thus avoiding the interruption of daily broadcasts.

THE GREENWOOD THEATRE RE-FURBISHED



The stage apron, Link 125 cameras and auditorium of the Greenwood Theatre.

The Greenwood Theatre, situated in the grounds of Guys Hospital, near London Bridge Station, has recently undergone an electronic face-lift. The theatre has been on the site since 1975, having been built following the death of Sir James Mantle Greenwood, J.P., Governor and Benefactor of Guys Hospital from 1960 to 1969.

The BBC became interested in using the theatre in 1978 when plans were being made for extra editions of "Parkinson", and new shows such as "Russell Harty", and "Question Time". By September 1979, when the theatre first went on the air, the SCPD team, led by Project Leader Brian Fitt, had to carry out a considerable amount of work to accommodate the television production and engineering facilities, all in a very hectic three month period.

An old Type 2 Outside Broadcast CMCR (L04) was redeployed and parked outside the theatre to house the vision equipment. A new production and lighting control desk was constructed and installed at the rear of the auditorium. A new vision mixer was diverted from Southampton for use in the desk; the sound control desk was diverted from use in a type 5 CMCR and installed in the sound control room. The front four rows of seats were removed, and finally, a full television lighting rig with new suspension barrels was installed ready for the first programme on 23rd September 1979.

Following the re-negotiation of the lease this year, it was decided that the temporary facilities should be given a more permanent home. The CMCR was removed, and throughout the summer engineers from SCPD led, once again, by Brian Fitt, renewed the vision system, and consolidated several small items that were of temporary nature.

A new technical area was con-

structed and now doubles for both a maintenance and vision apparatus room. By careful arrangement of the equipment bays, it has just been possible to fit everything in. The Theatre has been equipped with six Link 125 cameras. Four are fitted with Schneider 15:1 lenses, and a fifth at the rear of the auditorium with a 30:1 lens. The sixth camera is a maintenance spare.

At the back of the auditorium the production control room has been given a face lift although the original desk has been maintained. It has a Cox ABC 10 channel vision mixer, which is equipped with downstream keying, hard/soft edge wipes and effects. Normal camera CSO keying is available and decoded keying from outside sources. Production and Engineering monitoring facilities are also available on the desk. The monitor stack com-

prises twenty-two picture monitors, complete with source identification.

A Thorn "Scene Setter" 120 way lighting control console is built into the main desk. The Theatre's normal lighting control desk has been maintained in a separate room to allow the Theatre to be used for conferences or normal production at other times. The "Scene Setter" employs two floppy disc memory units, each capable of storing 300 memories. Push button channel selection, with single fader level controls enables channels to be selected singly or in groups. A light column indicates channel level.

The sound control room is located to one side of the auditorium, allowing side viewing of the stage area. A Neve audio mixer identical to those provided in type 5 CMCRs is installed, it has 24 channels and four groups, plus two 10 channel supplementary mixers. The control room also has two RP 2/6 disk reproducers, and two Studer B62 tape machines with remote start/stop facilities.

In addition to the production and sound control rooms, the Theatre has several dressing rooms, wardrobe and make-up room, green room, caption room, storage area and a canteen/rest area. Four vision lines and 12 sound lines link the Theatre to Broadcasting House.

Brian Fitt said, "The Theatre has restricted facilities when compared to Television Centre, but still manages to compete successfully. The "Russell Harty" show on Tuesdays reveals how the production and operational staff have overcome any deficiencies".



The Neve 24 channel sound mixing desk in the sound control room at the Greenwood Theatre.

SAFETY AT HEIGHTS

Dennis Turner, the Engineering Safety Adviser, picks out some salient points for safety at heights. Not many BBC engineers and operators are called upon to work at heights - or are they? When you start to think about it, the number of staff who work at heights - on ladders, camera platforms, lighting grids, transmitter masts - are probably more than you realized.

Wherever people work at heights there is some cause for concern, some reason to take extra care. Not only do physical conditions make accident prevention that much more important, and that much more difficult, but differing degrees of preparation, training and safety consciousness to be found among staff can also contribute to the hazards. The need to encourage a uniformly and safe approach to work aloft has been the concern of BBC safety committees and management for many years. Responsibility begins with the Corporation management concerned. They must establish safe-working procedures before work is started aloft. Management has an obligation to make sure there is an effective induction procedure for staff, covering all accident prevention requirements, and this is particularly important where work is undertaken at heights. The staff concerned must follow the rules and take care of themselves and their colleagues. For the majority of cases, the rules are contained in General Safety Regulation No. 10 but there are some tasks that take us into more difficult territory.

For these more difficult tasks there has to be particular insistence on a trained work force. In the case of work on aerial support structures - masts and towers - where the person doing the job has to make minute by minute judgements that may affect his own safety and that of staff working with him, only 'authorized' climbers may be used - and authorized climbers must be trained members of staff.

For all areas of work it is a legal, and a commonsense, requirement that an 'appropriate and adequate' means of access be provided. If the appointed access is inadequate, there will be a tendency for people to use unauthorized routes which may be dangerous.

This is a particular problem if staff are working above ground. Sometimes access will be by means of an aerial ropeway or hoist. However, Cranes or winches with 'free fall' mechanisms or without a 'dead man's handle' must never be used for raising, lowering, or suspending people. When lifting or lowering persons, and when

loads are in suspension, the crane or winch driver must stay in his driving position and at his controls all the time.

The provision of adequate ladders and walkways as a means of access should be encouraged whenever it is reasonably practicable to do so. Using the open steelwork instead of a ladder should be avoided. It is usually unnecessary for anyone to use open steelwork as a means of access, with the exception of men undertaking inspections after the initial erection of the structure.

Nobody should be required to work from open steelwork except in circumstances where they possess the necessary expertise and where it is not reasonably practicable to provide purpose-made working platforms. In particular, working from open steelwork should not be permitted where:

the steelwork has wet paint on it or is in a frosty/icy condition;

the work is repetitive and lasts for a period of time which could cause the workman to lose concentration

Where staff are required to work from open steelwork, anchor points or wires for attaching safety harnesses and lines should be installed. In some cases the steelwork itself will provide sufficient anchor points. The staff concerned should wear safety harnesses and always have them attached to the appropriate anchorage when they are working. Steelwork and working positions should be kept free of tripping and slipping hazards such as nuts, bolts, and cables, etc. If trailing cables cannot be eliminated, the access routes should be defined so that these cables are avoided.

Platforms aloft must be of sufficient strength and rigidity, and adequately supported, to carry the heaviest load likely to be imposed on them. Such platforms should be purpose made and, where possible, made and assembled at ground level and lifted into position. They need to be secured against tipping, overturning or accidental movement. In many cases, of course, the platforms can only be assembled in situ.

Working platforms must be close-boarded all over their surface. This means that the surface of a working platform should contain no gaps through which small objects can fall and endanger persons who may be working or passing below. The platform must be sufficiently strong and rigid and be adequately supported for the heaviest load to be expected. Scaffold

boards and their use should conform to the relevant British Standard. The boards should not be painted as this could hide defects, and similarly boards should not be used if they are contaminated

Working platforms must be fitted with guard-rails which should be rigid rails or tubes. The guard-rail system should comprise a top rail at 1m above the floor, a middle rail 70cm from the floor and a toe board at least 6cm high. On camera platforms, the height of the top rail can be lowered in certain cases where this is necessary to obtain requisite camera angles, but the cameramen must be restrained from approaching the edge of the platform by wearing an appropriately secured belt and line. Working platforms without guard-rails and toeboards-, because the job being performed is of short duration, should be sufficiently wide and be provided with handrails which will withstand the shock load of a man holding on to the handrail to stop him falling. Safety harnesses should be provided working at heights without guard-rails and *must be used*.

Wire ropes should be marked with the Safe Working Load (SWL). Uncertified wire rope, without its Safe Working Load readily identified, must not be used as a means of suspension or support. Faulty materials or components used in the construction of working places should be scrapped and removed from the site.

The use of a piece of tubing as an extension to a spanner or other tool for more leverage is bad practice under any circumstances, and must never be done when working aloft. The consequences if the tube or tool slips off when working at a height, or on a working platform with guard rails, could be serious. The correct type, size, and length of tool, should always be used.

Engineers Meeting

Over two hundred engineers-in-charge and senior engineering managers attended the annual "Es-i-Cs" Conference at the IEE on October 19th. The following day many took the opportunity of visiting Designs Department, Television Centre, and the Crystal Palace Transmitters to catch up on new engineering developments.

The conference programme included a presentation on DBS by Bill Cotton and Peter Rainger, and a report on the state of BBC Engineering by DE. After lunch Richard Francis (MDR) spoke about radio broadcasting in the nineties, and finally the conference was addressed by Alasdair Milne (DG).

TELESOFTWARE

As part of the Computer Literacy Project the BBC is about to launch the world's first regular public broadcast telesoftware service. Programs for the BBC microcomputer are formatted onto Ceefax pages in such a way that they can be automatically loaded into a machine fitted with a telesoftware adaptor. The initial service is expected to be mainly educational, where schools need a reliable source of known quality software. Telesoftware not only allows this central coordination, but also permits immediate updating and correction of program bugs. No doubt amateur computer enthusiasts will also contribute and find useful ideas from the broadcast software.

There have been experimental telesoftware transmissions for some time, firstly as part of an educational experiment run by Brighton Polytechnic with help from the BBC and ITV, and secondly there are programs in BBC Basic for demonstration and testing of the new BBC microcomputer telesoftware adaptor. These programs are on BBC1 Ceefax pages 700 onwards.

The teletext and telesoftware adaptor for the BBC micro is produced by Acorn Computers, being based on decoding and logic techniques demonstrated last year by Jim Chew of Engineering Research Department. John Salter of Engineering Designs Department provided advice on the television tuner. The signal from a tuner module is fed to Mullard chips as found in a conventional teletext decoder. These take the teletext data off the lines in the vertical blanking and provide a clock signal. The data and clock signals are converted to parallel 8 bit data and placed in a buffer RAM which can also be accessed as a computer peripheral via the BBC micro's IMHz bus. During one field interval up to 16 teletext rows are grabbed. The computer then has up to 20mS to read the data from the buffer RAM into its memory. All subsequent decoding is performed by software, giving a performance superior to a conventional teletext decoder.

Teletext was designed as a text information system where each 7 bit code transmitted requests a character or mosaic pattern on a fixed grid of 24 rows by 40 columns. Telesoftware however need not be text, it is a variable length stream of binary codes which represent the program. These codes may be in any computer language, although at present we expect to use BBC Basic. The specification for telesoftware, drawn up by David Rayers of

Engineering Research Department in conjunction with Acorn Computers, with agreement from other interested parties, has to take account of these special characteristics and so additional features have been added to the transmissions. Firstly pages are chained, that is each page points to (contains the page number of) the next in the sequence. This means that there is no restriction on program size. Secondly there is a cyclic redundancy check which will verify the contents of a page. This is now on all Ceefax pages, but is especially important for telesoftware where one error can invalidate the whole program. With this error checking we can transmit 8 bit codes, which are more suited to computer architecture, than the 7 bit codes which are used now. Finally it is possible to put the telesoftware on pages that cannot be selected on a conventional decoder. These pages have hexadecimal addresses and are particularly suitable for pages that are not meant to be read.

The data on the pages is formatted with machine readable protocols. In the case of telesoftware the protocols are redefinable. That is, each 8 bit code may represent a character, a string, a command to the decoder, or may be ignored. The meaning of each code can be changed dynamically during the transmission, which gives a flexibility to the system. For example if the string 'CABBAGE' appears many times within a program it can be replaced by one byte which will save transmission time.

Work is underway in Studio Capital Projects Department and Ceefax to automate loading of programs onto the Ceefax computer for transmission. A BBC microcomputer system will talk directly to the Ceefax PDP11 via a serial interface. Programs on various media like cassettes and disks can then be checked and put on air in a matter of minutes.

SAFE CLEANERS

A revised edition of Engineering Management Safety Complittee's Guidance Paper 5 *Solvents and cleaners used on technical equipment and in workshops*, has been printed and will be issued shortly on Distribution S. The paper contains a general introductory section followed by an alphabetical guide to solvents and associated

'NEW

E.N.G.

FACILITIES

The development of Current Affairs programmes, and in particular, the advent of Breakfast Television, has called for an expansion of resources. These include the provision, by TCPD, of a radio link communications vehicle to support the proposed CMCR operations. The vehicle will have both 2.5 GHz and 7 GHz radio-link transmitters to enable the vehicle to operate into existing ENG terminals (2.5 GHz) and Tel OB permanent reception terminals (7 GHz). A 12 GHz short range link, cable injection equipment and comprehensive communications and monitoring equipment will also be included.

The vehicle to be used is a Mercedes van type 608D. In addition to the technical equipment described above, it will be equipped with a 42 foot telescopic pneumatic mast, roof platform, stabilising jacks, airconditioning and an on-board AC petrol generator.

A third E.N.G. receiver site is to be established by TCPD at the Barbican Development, to enable E.N.G. and Current Affairs greater access and flexibility in establishing E.N.G. 2.5 GHz radio link circuits. This will be in addition to the permanent sites at Millbank and Crystal Palace. The Barbican terminal will be substantially similar to the other two terminals.

The Television Service requires these two allied projects as soon as possible, in order to have the facilities available for the start of Breakfast Television.

:£. :£. :£.

TRANSMITTER NEWS

The following transmitters have opened since September.

Uhf television

Scotland

Strathblane
Ness of Lewis
Dumfries South
Largs
Dunure
Tarbert (Harris)
Tillicoultry
Cathcart
Twechar
Holmhead
Bellanoch

England

Patcham
Hangleton
Rye
Wootton Courtenay
Micklefield
Orton
Chiseldon
Alexandra Palace
Ipswich Stoke
Melling
Portishead
Redcliff Bay
Caterham
Kenley
Penryn
Turves Green

N. Ireland

Cushendun
Cushendall
Glenariff
Buckna

Wales

Abercynon

Vb radio

Varteg Hill (Wales)

The "Transmitter Information" programme broadcast on BBC 1 or BBC 2 on weekdays for tv dealers and traders, has been discontinued. The programme, which went out mid-morning, was intended to tell dealers about new transmitters, or maintenance work likely to affect transmissions in their area.

For some time now this information has also been carried on Page 196 of CEEFAX, giving a record of current transmitter news. This has benefitted the trade, many of whom were out of their shops on service calls when the television programme was being transmitted. Engineering Information Department are responsible for updating the information on Page 196, from

detail, supplied by the Group MICs.

The following appointments in Transmitter Department have been confirmed:-

Jim McKay, presently Acting Transmitter Manager, Woofferton, will become Company Manager, Caribbean Relay Company in January.

Alastair Malcolm, presently Senior Transmitter Manager, Woofferton, will become Resident Engineer, Far Eastern Relay Station in March.

Neil Wilkieson, presently Company Manager, Caribbean Relay Company, will become Acting S.T.M., Woofferton in February.

Neville Pickering, presently Resident Engineer, Far Eastern Relay Station, will become Acting T.M., Woofferton in May.

> > > > > >

Alexandra Palace, the home of the world's first regular high-definition television service, has returned to an earlier role when it began broadcasting TV programmes again, on November 4th. It is a new uhf relay station built to help 10,000 viewers in North London who have been struggling to obtain good reception.

The original BBC Television Service started at Alexandra Palace on 2 November 1936 and continued until 1 September 1939, shortly before the declaration of war.

After the war the television service resumed from Alexandra Palace on 7 June 1946. The AP transmitters stayed in use until 27 March 1956 and, on the following day, the Crystal Palace station took over the service for London and the South East. In the late forties and early fifties, the television service spread widely throughout the UK and many transmitters were brought into service in time for the Coronation in 1953.

The Alexandra Palace studios stayed in operation for general programmes until the early fifties when BBC Television moved its base to Shepherd's Bush - initially to the Lime Grove studios, then at the Television Centre. Television News stayed on at Alexandra Palace until 1969 when its extension at Television Centre was ready. The AP studios were then refurbished again for the Open University Production Team which occupied the Palace from 1971 to 1981, finally moving to Milton Keynes.

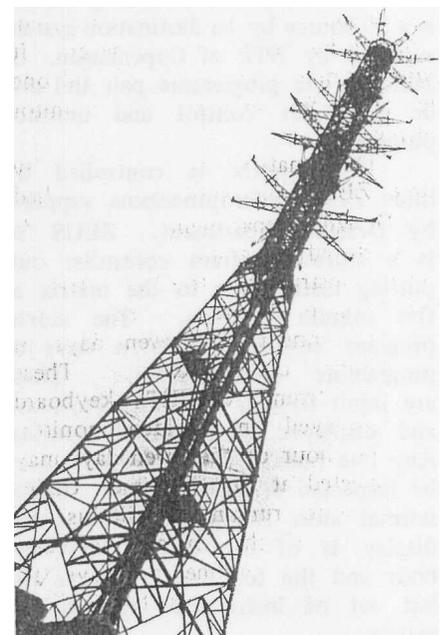
Before the war, service resumed after the war, the Alexandra Palace transmitters were used for some of the early experimental transmissions of vhf radio. The experiment eventually led to the choice of frequency modulation for vhf radio and the start of the BBC's vhf radio service from Wrotham in May 1955.

The "Ally Pally" relay, planned by the BBC and the IBA, is designed to solve reception problems in parts of Stroud Green, Crouch End, Hornsey and Hornsey Vale, Muswell Hill, Southgate and the part of Wood Green just north of the Palace. These are all areas where local hills partly obstruct the signal from the Crystal Palace main station. The relay is certain to help even more viewers in the area suffering reception problems caused by nearby tall buildings.

For those wishing to use the new relay, the channels used are:

ch 54	IBA's Channel Four
ch 58	BBC 1
ch 61	ITV - Thames Television/ London Weekend Television
ch 64	BBC 2

Note that the aerial polarisation is horizontal, group CID.



The original transmitting mast at Alexandra Palace.



EXTRA PROGRAMME SWITCH

Prior to 1982 the Middle and Far Eastern transmitters of the External Services were fed with programme by ssb senders located in Britain with RBR facilities at the transmitter sites.

With the advent of geo-stationary satellites for communication purposes it becomes possible to utilise their facilities to provide point-to-point feeds of broadcast programmes of an enhanced audio quality compared to that provided by the RBR system.

External Services have opted to 'take advantage of this better quality distribution system and SCPD have supplied the necessary equipment in Bush House control room for this purpose. Initially the programme material will use both methods of onwads transmission. When the reliability of the satellite transmission path has been proven the ssb transmitters will be released for other duties.

The decision to duplicate feeds for a period has meant that SCPD has had to install extra programme switching and line feeding apparatus in Bush House Control Room.

The system supplied comprises a computer control solid-state switching matrix and extra line feeding apparatus to feed British Telecom for onwads transmission to the satellite ground station at Madley.

The solid-state switching matrix is a 30 source by 16 destination system supplied by NTP of Copenhagen. It switches one programme pair and one dc level for control and monitor purposes.

This matrix is controlled by three ZEUS microprocessors supplied by Designs Department. ZEUS 'A' is a stored program controller outputting instructions to the matrix at five minute intervals. The stored program consists of seven days of programme commitments. These are input from a QWERTY keyboard and displayed on a video monitor. Anyone hour of the seven days may be inspected at anyone time. Under normal auto running conditions the display is of the Current day and hour and the top line is always the last set of instructions fed to the matrix.

ZEUS 'B' is a manual override and system monitor controller. It is instructed by source and destination push button panel by means of which ad hoc variations to the programme commitments may be made. Alternatively full manual control may be undertaken by, the operating staff

should the stored programme controller be off-line for any reason. The associated video monitor displays the actual current state of the matrix and any error messages. Operator correlation of the two top lines of each display confirms the validity of the instruction with the state of the matrix. ZEUS 'c' is a minimal configuration microprocessor - interfaced to the station master clock

'MACRO-BENCH'

'continued from Page 1'
specific "spot" lighting. All are corrected for daylight colour temperatures.

Two control panels have been constructed for use with the bench. One is a semi-permanent fixture in the purpose built control room; the second is a smaller portable version for use by Film Cameramen and for field operations. From the main control panel it is possible to control all the servomotors associated with the platform, as well as the normal colour camera controls.

A "panic" button has been fitted that stops all movement of the platform: this is especially important when viewing on the display monitor, since one can very quickly become disoriented and this could lead to damage to the specimen or camera when the platform rotates in the wrong direction. As well as continuous control of the platform, various fixed positions can be set-up. All the controls can be manually operated, and provision has been made for computer interfacing at a later date.

A VPR-20 video tape recorder is situated alongside the control panel, and the camera output can be previewed on a 22 inch colour monitor before recording. Studio sound can be added via the control panel's communication

with fall back to internal time reference. It provides all the necessary timing signals for programme commitments stored in ZEUS 'A'.

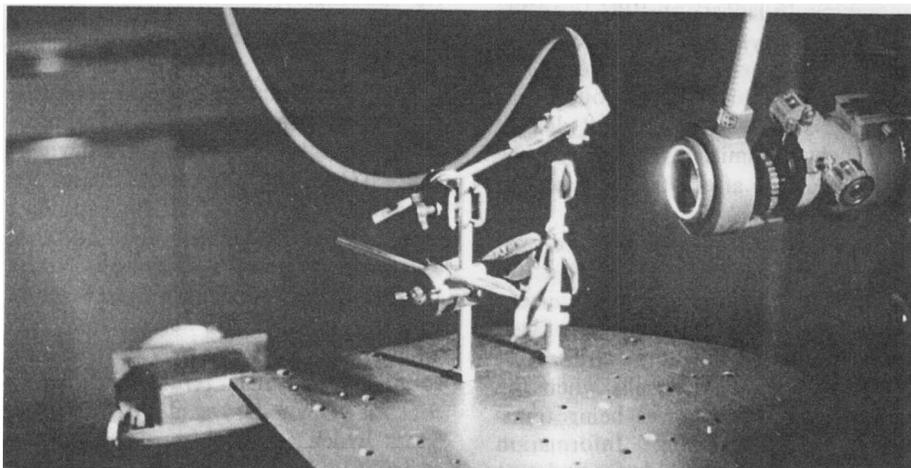
The remaining components of the system are normal line feeding apparatus and programme fail detectors and an extension of the existing programme monitoring system. The system went on-line in November 1982 and SCPD wish to thank Designs Department for their cooperation in supply and programming aid of the ZEUS microprocessor systems.

facilities.

The project leader for the new facility was Denis Valitis, who said, "We worked in close co-operation with the Natural History Unit when designing the Bench, and they are delighted with the results".

Programmes such as "Animal Magic", "The World About Us" and "Wildlife on One" have already used the macro-bench and currently "Planet Earth" is doing so. Other programmes, such as "The Antiques Roadshow" have made provisional bookings, so that small objects such as stamps, coins and even hallmarks can be closely examined.

The macro-bench and the control desks are housed in a basement area of an existing building. The area has been divided to form a control room which is similar to that found in television studios; and a laboratory studio area where the macro-bench is situated. The reason for the laboratory facilities is simply to do with the subject matter of the programmes. Biological and entomological specimens require copious supplies of hot and cold water, a refrigerator to keep them cool, and storage for a range of laboratory apparatus. The whole area is designated the Macro Studio and provision has been made to connect it to the Communications Centre in Bristol, and thence to the distribution network.



Fibre optics carry the lighting to the macro-bench top.