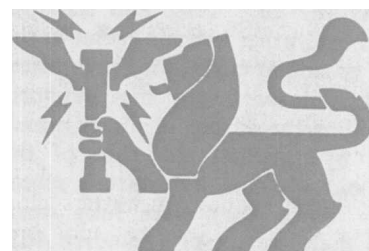


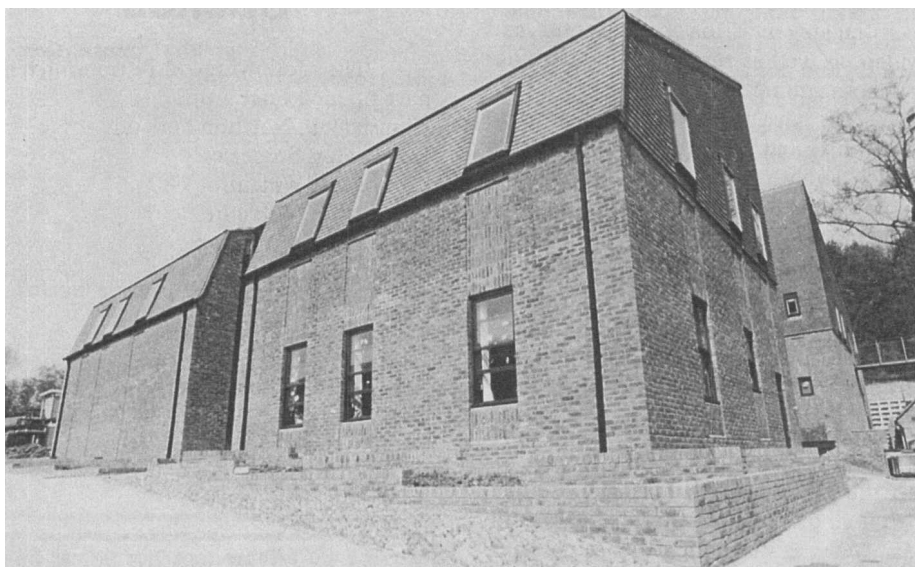
# ENG INF

The Quarterly for BBC Engineering Staff



## ENGINEERING TRAINING

### New building nears completion



*The newly-constructed Avon Wing at Engineering Training Department, Wood Norton.*

Engineering Training Department has been based at Wood Norton since 1946, but it is only now about to occupy a building designed specifically for its use.

The building, which has an area of 16,000 square feet, is to be called AVON WING. It will be used for Radio, Communications, Fundamentals, and Computer training for technicians and engineers, and replaces the present rather scattered and cramped accommodation in the old wooden huts.

The design of the new building emphasises the belief that most learning is by one's own actions rather than the words of others. Thus there are only two classrooms in the building and one is designed for later conversion to a more active role. Additionally there is an audio demonstration area designed to allow sound reproduction under conditions which allow critical listening and appraisal. This area can double as a

lecture theatre for conferences and has full facilities for this role.

Otherwise the learning areas are wholly concerned with student activity, either in practical work, using an extensive range of up to date equipments, or in the resource areas, using packaged learning material.

The resource areas match the latest step in the Department's moves towards 'learning on demand'. In this the traditional course format would be replaced by a system whereby individuals or small groups of students are given exactly the right training at the right time. This avoids redundancy in the training given, and allows its immediate application - it is wasted otherwise. Motivation is improved because the purpose is clearer and personal involvement is high.

To achieve this the training must become 'modular'. That is courses must 'continued on page 4'

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# Editorial

As the BBC celebrates its 60th Anniversary, other historic events in the area of broadcast engineering take place. Almost unnoticed in the euphoria surrounding the advent of direct broadcasting by satellite, the first of the BBC's old 405-line transmitters closes down. When they were fully operational there were over a hundred 405-line vhf transmitters serving 99.5% of the population. It is interesting to reflect that in the uhf band we need nearly six-hundred 625-line stations to provide the same service.

The start of satellite broadcasting will bring a population coverage of almost 100% with only a single relatively low-power transmitter. There will be no "phased introduction" of the new DBS channels, with major conurbation benefiting from the new services first, followed by the scattered rural populations the service will be available to everyone from the day transmissions start.

Other areas have also lost a little bit of history. At Wood Norton most of the old green huts have disappeared, and a splendid new building has taken their place. HETD reports that when they were demolished an old Players cigarette packet was found wedged between two of them. Inside it bore the message, "The bloke who finds this will know who won the wad" I wonder if there are any more epitaphs in other historic buildings, written by engineers who have long since retired?

International Broadcasting Convention 1982

In keeping with past IBC events, BBC engineers have submitted a variety of papers to the Convention, and will be exhibiting some interesting equipment in the exhibition. Also in keeping with previous years is the ticket allocation. Departmental heads have full details of the reduced rate attendance, but for lesser mortals the cost is £100 + VAT for the full Convention or £26.05 a day. There are an unlimited number of exhibition-only tickets at £20 for four days or £5 a day, obtainable from EID or the IEE. Sadly there are no FREE tickets; engineers wishing to visit only the exhibition must either pay the £5, or persuade someone to admit them as an exhibitor! For those on-shift or otherwise occupied during the period 18th -21st September, the next edition of 'Eng Inf' will carry full details of the event, and thus keep everyone informed of the up-to-date developments in BBC Engineering.

Alan Lafferty



# DOWN to EARTH

In these days of such rapid progress, it is easy to concentrate on high technology and neglect some of the more mundane aspects of engineering practice. One example is the running of technical cables, including those for the provision of technical earths. For us simple people the latter may seem to be a problem that falls into the court of the authority providing the electricity supply. The three pin plug has an earth pin and as long as you connect the yellow and green covered wire to it all should be OK!

In practice it isn't quite so simple. Mains earth and technical earths should be separate systems. Earth loops and leakage currents in the earthing system can create hum on both sound and video, as well as such undesirable things as clicks and noise.

We have now learnt, and wish to pass on to our readers, two simple rules which apply whether running cables on a station with a simple technical earth system or in a large regional centre with a more complex noise free type of earth system, such as Pebble Mill.

The two rules are: 1. All technical cabling, including earths, must see a single route or path back to the Central Technical Area (CTA). 2. The cable connecting the technical or noise free earth distribution point in the CTA to the Station Earth must be insulated from all other earths throughout its run, as well as meeting the impedance specifications.

The diagram shows various technical cables radiating out like the spokes of a wheel from a Central Technical Area. If we continue the analogy further, the spokes become the single defined routes from the CTA to various technical facilities and the hub of the wheel represents the CTA, itself. Any new area could be positioned either along an existing spoke or on a new spoke. Any connection from a facility on one spoke to that on another must be made via the hub.

The thing NOT to do is take a



"I'M Nd'r SullE THHf  
A",-o", "Tf TRANSTTETS  
"ILL wo...";!"

## Transmitters Opened

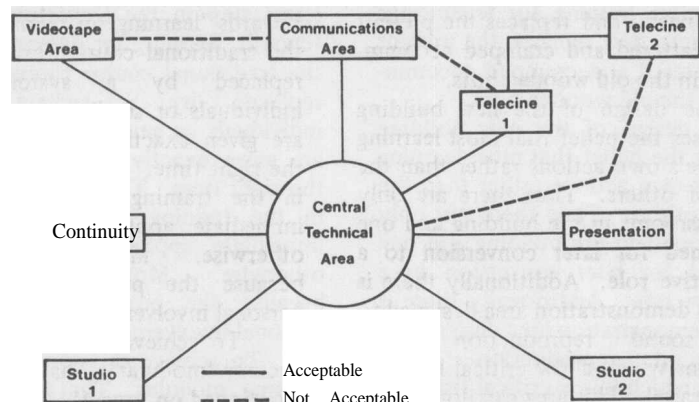
The following uhf transmitters have opened since April:

Humshaugh, Northumberland  
Roadwater, Somerset  
Aldbourne, Wiltshire  
Crockerton, Wiltshire  
Portslade, East Sussex  
Patcham, East Sussex  
Charlbury, axon  
Bellanoch, Strathclyde

**Mf**

New Radio 4 transmitter for Plymouth  
Local Radio  
Radio Cambridgeshire  
Radio Furness  
Radio Northampton

.short cut by joining together points on different spokes. Le. under no circumstances should any connections be made round the rim of the wheel. If you did do this, the points could be at different potentials with respect to the hub or central earth. Earth loops would be formed which would produce hum, and other types of interference could be induced in the circuit. Although longitudinal stop coils can be used on video circuits at some expense, why not try and avoid the problem at its source. Then we can all get away from the wheel and back to the high technology.



# RADIO O.B.s GET NEW MOBILE STUDIOS

At the rear of the vehicles is a radio-link compartment. The vehicle is permanently equipped with a 10 metre pneumatic mast that can carry a range of aerials dictated by operational requirements. The radio-link equipment is mounted on a trolley and is only installed in the vehicle according to specific programme requirements; this avoids the need for permanent and expensive equipment installations. The area can be used for receiving off-air signals for monitoring and cue purposes, or for the transmission of commentaries to a suitable pick up point for insertion into the network output. It can also be used as a reception point for manpack transmitters in use in the field. Besides providing access to the main studio, the vehicle cab can be used as a commentary position, cue lights and microphone points having been incorporated in the vehicle design. In addition, the roof has been reinforced and a guard rail provided so that commentators may broadcast from this safe vantage point.

Dave Swaysland, from SCPD, the vehicle designer, describes it as probably the most complex OB vehicle in Europe built for work of this kind. Duncan MacEwan, CERB, said "I am absolutely delighted to take delivery of the new vehicle, and look forward to seeing it used productively at future outside broadcasts. It will considerably enhance the operation of Radio OB's throughout the OK."

Its overall length is 11 metres, the maximum permitted by the Road Traffic Act and the width 2.5 metres. The vehicle is equipped with a dual steerable front axle to allow manoeuvrability in confined parking spaces. The coachwork has been built to a BBC specification by CMA Coachbuilders Ltd. in London.

*The production studio at the front of the mobile radio studio.*

Radio Outside Broadcasts took delivery of a new mobile studio in time for the London Marathon on May 9th. The new vehicle, designed by SCPD in conjunction with Radio Projects and OBs Departments, is the first of two such vehicles intended to complement the more specialised vehicles in the Outside Broadcast fleet.

The new mobile studios, which will be based in London, are available for use on a variety of general outside broadcasts throughout the OK demanding complex facilities. After the London Marathon the first vehicle was used for The Derby and Wimbledon, and for the Pope's visit and Trooping the Colour. Both vehicles have been designed for Party Political Conferences and Trade Union Congress sessions, the News and Current Affairs coverage of which means the setting up of temporary studio facilities close to the source of information.

The vehicle based on a Ford R114 coach chassis, contains three main operational areas. At the front of the vehicle is the main studio with associated microphones, fixed seats and production control facilities. Two windows on either side allow the commentators and presenters to be "on view" to the public if required. The studio has been acoustically treated, and acoustic shutters are provided to cover the windows when operationally necessary. Commentators and contributors can enter the studio via the vehicle cab and will not disturb operations in the control room. The studio is equipped with two television monitor-receivers which allow off-the-tube commentaries to be made. LS3/5A monitor loudspeakers are also provided. The studio can communicate with other operational areas via a

24-channel communications facility manufactured by Glen Sound, thus permitting Executive Producer control when required.

Access to the control room, which is located in the centre of the vehicle, can be had from the near-side or off-side of the vehicle according to local parking arrangements. A 30-channel sound mixing desk also manufactured by Glen Sound has been mounted lengthwise in the control room. The desk can handle up to 24 outside sources each with individual talkback and cleanfeed facilities. The 30 channels can be arranged to feed four stereo group faders. Comprehensive telephone and communication arrangements have been provided where necessary. The control room, which is also acoustically treated, is equipped with two LS3/7 monitor speakers, and two television monitor-receivers. Up to four stereo tape recorders and two disc reproducers can be installed in the control room. They can be remotely operated from the desk, or used independently as required for editing.



*The 30-channel/ Glen Sound mixing desk, LS 3/7 monitor speakers, and monitor-receivers.*

'continued from page 1'

be broken down into small blocks which can be offered in appropriate combinations to meet individual needs. The training is thus tailored to the student, and the job to be done.

To offer such a flexible service, the traditional approach of 'talk and chalk' in the classroom must be replaced by a system which makes the training material constantly available. Many blocks or modules of material must be 'packaged', i.e. arranged to stand alone, and not require a supporting structure of lectures. This can be done by the use of text, audio and video tape, 35mm slides and special practical equipment.

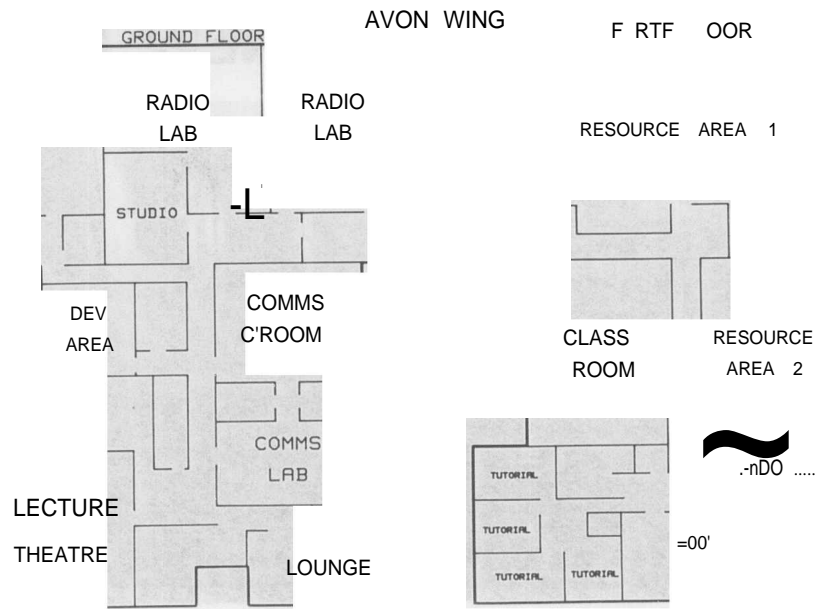
Packaged learning is not new, but the idea of using it to cut the logistical constraints of traditional course structures and so to offer 'learning on demand' is exciting. It is a dream that has been long discussed but seldom attempted.

ETD began that journey many years ago now. Firstly by placing less emphasis on the classroom in favour of hands-on experience and then, in recent years, by developing its skill in producing learning packages.

The first attempts were in the mid 1960's when a range of programmed learning books was produced. A broader and more flexible format began to be developed in the mid 1970's. This has led to courses on digital techniques and microprocessors, to the 5 week B Part 1 course for Technical Assistants and, most recently to a week covering the bulk of material on Television fundamentals, colorimetry and colour coding (see story on "back page"). There is a long way to go yet but experience is now sufficient to demonstrate that the technique is viable and well worthwhile.

The method does not fit well into traditional classrooms as the students do not all do the same things at the same time. Whilst having firm targets to meet they can nevertheless take time over areas of personal difficulty and choose for themselves the convenient moment to take a break. They discuss problems with a partner and their tutor. Many assessments - an essential feature of the system - are initiated when they declare readiness. Those who are falling behind the target programme can do additional work out of normal hours using the packages and supporting facilities.

All this requires an environment which encourages personal responsibility, allows concentrated but diverse work and close but unobtrusive supervision. Refreshments should be available constantly, particularly for



*A plan of the new Avon Wing at Wood Norton.*

those choosing to work out of hours.

The resource areas of Avon Wing are designed to create this environment and the building provides refreshments near at hand. You can best liken the areas to a modern and very pleasant open-plan office with acoustic screens separating work points. Each work point is fully provided with mains power, a range of audio and video feeds and necessary equipments. One resource area is dedicated to computer training and in this each work point has its own data lines and many have VDU's or micro-computers. The area is served also by a powerful PDP11/44 Mini-computer.

The radio training areas cover both programme origination equipments, (sound desks, tape machines, etc.) and control room equipments, together with all necessary measuring apparatus. A typical and fully equipped radio studio is included though it is not typical in its sizes. The control room is much larger than the

studio area to enable students to have plenty of room to work on equipment and to see demonstrations.

The front of the building includes five tutorial rooms - a sign that the learning system must not be seen as automation - on the contrary it is very much based on contacts between people.

The building has other unusual features; for example, part of the heating is by solar energy. The house services area, which contains the heating and air conditioning plant and the electrical switchgear, has been designed to allow house services courses to examine these facilities, and to use the instrumentation as part of their training.

Finally the front part of the building, containing the audio demonstration area, tutorial rooms, refreshments and facilities, can be isolated from the rest of the building to form an occasional weekend conference centre for up to 40 people.

*The first three draughtsmen to complete the BBC's new training scheme were recently presented with certificates by ADE. Pictured in the photograph are (left to right): Iohn Mitchell, Training D.O. Manager, Kevin Swales, Liz E'ington, Personnel Officer, Bob Neale, Engineering Recruitment Officer, Colin James, George Cook, ADE, and Mario Georgiou.*