

ENG INF

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Transcription Service New OB Vehicle

The Transcription Service has been making BBC programmes available to other broadcasting organisations throughout the world for more than half a century. The Transcription Service catalogue contains over seven thousand hours of programmes which are increased by an additional three hundred and fifty hours every year. These range from classical, jazz, and pop music, to drama. Programmes come from many different sources, such as Radio 3, Radio 4, or the World Service, but programme recordings are made by the Transcription Service at public concerts and festivals when a ready audience can be found abroad.

The Transcription Recording Unit (TRU) provides the engineering support for the Transcription Service. Based at Kensington House in West London, they maintain and operate two studios, a number of recording and disc-cutting channels, and External Services' only Outside Broadcast vehicle. This is used to cover the major serious music festivals such as Aldeburgh, Bath, Cheltenham, Edinburgh, and the Promenade Concerts. The Outside Broadcast vehicle, which is in operational use for more than one hundred and thirty days a year, is also used to cover rock, folk, and jazz, and "middle of the road concerts."

A new mobile recording vehicle - TRV2 - has just entered service with TRU, replacing an ageing Bedford which latterly could only operate in first gear! The new vehicle, designed by OB Section of P & ID Tel, is based on the Ford R chassis, with body work by CMA coach builders. It houses a Solid State Logic 4000E computer-assisted 48-channel mixing desk, with an additional SSL 8-into-8 submixer. On board is an Otari 24-track tape machine equipped with Dolby noise reduction. Three Studer A810 tape recorders with centre track

time-code option complete the analogue line-up. Two Sony Fls can be used for digital recording, with Sony 1610 Umatics available as an option; facilities have also been provided for the installation of 24/32 track digital recorders in the future.

Audio monitoring is via a pair of LS 5/8 loudspeakers, which are specially shaped to fit neatly into OB vehicles such as TRV2. Facilities exist for visual monitoring via a CCTV system and a TV cue receiver. The vehicle has a range of AMS and Lexicon reverberation units and digital delay lines, a comprehensive communications system, and access to TRU's extensive range of microphones.

A small maintenance area at the rear of the vehicle doubles to provide domestic facilities such as a wash-basin and refrigerator. The vehicle is fully air-conditioned, and the cab has been acoustically treated so that it can be used for presentation or commentary as necessary.



The Transcription Service new OB vehicle

Editorial

In response to complaints from the hard of hearing about the poor audibility of dialogue in some television programmes, a working group has been set up to study the problem. The group consists of representatives from the BBC, the IBA, the ITCA, the RNID, and the British Association for the Hard of Hearing.

People suffering from hearing difficulties have complained that they find it hard to follow dialogue in television programmes when any accompanying background sounds, such as music, audience response and effects, are present at a similar level. The working party intends to organise a series of tests to investigate the way that this type of sound balance affects the intelligibility of the dialogue, both for hard of hearing and normal hearing viewers.

Background sounds are used in television programmes to help create 'atmosphere' and to add realism to the production. The objective of the tests is to see if it is possible, without impairing the artistic effect, to adjust the sound balance so that people with hearing difficulties can more easily understand the dialogue.

The tests are likely to be complicated by the large number of factors that contribute to the problem and the manner in which hearing difficulties vary between individuals. However, it is hoped that the investigation will lead to a clearer understanding of the problem and suggest ways in which the situation can be improved.

Alan Lafferty

Licence Agreements

Audio Kinetics Ltd of, Theobald Street, Borehamwood, Herts, have signed an agreement allowing them to manufacture the Vertical Interval Timecode Reader CD3S/549 and the Vertical Interval Timecode Converter CO4S/518.

The Vertical Interval Timecode (VITC) Reader, CD3S/549, accepts a composite video signal with inserted EBU VITC which it decodes and re-encodes to produce two outputs. One output is of longitudinal timecode which follows the frame rate of the incoming VITC, and the other is serial RS423 data suitable for connection to a microcomputer. The unit also displays the decoded time on a front panel LED display.

The unit is particularly suited to off-line VITC reading because the decoding circuitry can tolerate jitter and level changes in the input waveform. The unit is in a self-powered 4U B-width chassis.

The Vertical Interval Timecode Converter (VITC), CO4S/518, accepts composite video and EBU longitudinal timecode at normal frame rate, and produces a composite video output with EBU VITC inserted on a selectable pair of video lines. The converter also produces "in-vision" timecode characters of either large or small size at the top or bottom of the picture. A 1200 baud serial input allows external user-bits to be substituted for the longitudinal user-bits. The unit is in self-powered 4U A-width chassis.

Transmitter News

The following transmitters have opened or changed since September:

UHF TELEVISION

Carhampton	Somerset
Coalbrookdale	Salop
Conisborough	S. Yorks
Crediton	Devon
Cullingworth	W. Yorks
East Dean	E. Sussex
Edale	Derbyshire
Exford	Somerset
Kilve	Somerset
Knucklas	Powys
Lambourne	Berks
Leadhills	Strathclyde
Luccombe	Isle of Wight
New Barnet	London
Rampisham	Dorset
Wanlockhead	Dumfries & Galloway
Winchcombe	Glos

VHF RADIO

Kinlochleven	Highland
Darvel	Ayrshire
Bressay	Shetlands
Caterham	Surrey
Kenley	Surrey

LOCAL RADIO

Bilsdale West Moor	R. Cleveland
Great Massingham	R. Norfolk
Oliver's Mount	R. York
Great Braxted	BBC Essex
South Benfleet	" "
Manningtree	" "
Chelmsford	" "
Southend	" "

The SCAR at Television Centre

P&ID Tel have recently introduced a new Spur Central Apparatus Room (SCAR). It replaces the old area which had seen service dating back to 1969 when News moved from Alexandra Palace, with no major work having been done on it since then. The new SCAR was essential in to service the requirements of the recently refurbished News studios on the 6th floor, the addition of a large VT area on the fourth floor, and many other support areas such as SRU (Sound Record Unit), and FTT (Foreign Traffic Terminal).

Paul Drewett, project leader for SCAR refurbishment said, "What has been provided is an area with greatly increased routing and distribution capability; far more comprehensive monitoring arrangements, and communications facilities which allow a greater level of traffic to be handled. Flexibility has been a clear aim because the area has to cope with changing future requirements."

The main control desk provides monitoring and measurement routing and communications panels duplicated at both ends, with a miscellaneous area in the centre. There is an ENG wing to handle inserts to News from any of the reception sites, and a telephone divert and balance wing, to enable reporters to have their despatches recorded for transmission. All monitoring and communications facilities are repeated on a second check desk to the rear of the main desk.

It was acknowledged that a central area such as SCAR is constantly changing as new facilities are demanded by the ever changing programme requirements and availability of such technologies as satellite reception, electronic news gathering and the like. Because of this, it was considered important that the new control desk should cope with change without too much disruption to operations.

The whole desk is based around a very simple modular design. Any panel may be moved to a new position, and they have been cabled to allow for this (within limits). An important feature is that all panels are the same height, and a simple multiple (2,3 or 4) of the width of the narrowest. The wooden desk carcass was built in eight sections by carpenters at



SCAR Wiremen and Engineers celebrate after the changeover

Woodlands, and assembled on site.

The planning work for the refurbishment of SCAR started about three years ago. Initially it was thought that refurbishment would have to take place within the old area. Fortunately however, the P & ID engineer responsible for the original Sub CAR - as it used to be called - remembered seeing a drawing somewhere dated 1966, that had adjacent rooms marked "SCAR future expansion", and so these rooms were reclaimed for the new SCAR. (There's a moral there somewhere about information on drawings!).

After some 18 months of planning, the first phase of refurbishment introduced a main routing system to service the new VT area. This is a Probel 96 source to 96 destinations matrix with video and two audio levels, together with a crossbar matrix driven from the main routing, giving a further ten copper levels. The crossbar matrix was designed by P&ID Tel and manufactured under contract at a fraction of the cost of the equivalent set of solid state or relay matrices. An audio-only auxiliary sound router (which has 128 sources and 64 destinations) followed on shortly afterwards.

The second phase of installation work was the new control area, which went into

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SCAR the completed project

Art File graphics system

What is it?

Art File is a new television graphics system developed at Research Department, Kingswood Warren, which is finding increasing use in graphics areas throughout the television service. Art File allows electronically composed graphics to be drawn directly onto a television screen. Various graphic effects can be combined and existing television still pictures can be retouched. The artwork may be stored at any stage and recalled for later modification, if required. All this is achieved by hardware and software additions, at modest cost, to the Slide File electronic stills stores, which are now used in television studios throughout the BBC for broadcasting still pictures.

For readers unfamiliar with Slide File, it is a television picture store capable of storing a minimum of eighty-four still pictures in digital YUV form. Pictures may be accessed in one second and simple cutting and crossfading can be carried out. Additionally, a scrollable 'polyphoto' display allows thirty small versions of recorded pictures to be displayed simultaneously on one screen for selection purposes. Slide File can accept either still RGB inputs or 'grab' a frame from a moving RGB or decoded PAL or NTSC input. In the case of grabbed pictures a number of picture 'clean-up' options are available.

Both Art File and Slide File are manu-



The graphic artist is drawing with the magnetic pen on the graphics tablet whilst observing the effect on a colour monitor. The system VDU, which displays informative messages, is shown on the right.

factured and marketed by Rank Cintel who demonstrated Art File at the recent International Broadcasting Convention in Brighton.

The Background

Research Engineers had always been aware that the microcomputer in a Slide File might be able to generate and manipulate elements of a television picture. However it was only following a request from Manchester in 1983 that work commenced to exploit this. Manchester was, at that time, equipped with a Slide File and a Logica 'Flair' - an electronic colour drawing facility - both of which were performing their separate functions.

Research Department engineers were asked to investigate the possibility of combining some of the functions of Flair with those of Slide File to provide simple full colour 'cut and paste' facilities. Specially written software enables the two separate equipments to be combined successfully in this way. The concept for Art File arose from this practical experiment and subsequent work was undertaken by Research Engineers to determine what minimum additional hardware and software would be required to enable a Slide File to perform as a stand-alone electronic graphics system. Their efforts resulted in this being done at minimal cost. During development, Research Engineers received valuable help and advice from Graphics Design staff at Bristol, and their combined efforts have culminated in the present comprehensive system which is now installed as an add-on to existing Slide Files in a number of graphics areas throughout the Television Service.

The new System

Basically, Art File comprises a graphics tablet, on which the artist 'draws' with a magnetic pen, and a vdu which displays informative data. These are supported by extensive software stored on the Slide File disc together with the normal Slide File software. Art File can be operated remotely from Slide File so that the artist can, if necessary, work in a separate graphics area, while the Slide File remains in its normal position in a studio. Obviously the two separate functions cannot be performed simultaneously and remote picture monitoring and control facilities must be provided under these circumstances. The new software (high level language PASCAL

supported by some assembly language routines), which converts Slide File into Art File, is considerably larger than the original Slide File software and some ingenuity was needed to squeeze it into the small computer system. However both the Art File and Slide File software together occupy only a very small part of the disc storage area.

The Graphics Tablet

The graphics tablet, which measures 720 x 850 mm overall, is used in conjunction with the magnetic pen to control all graphic functions, and to select between Art File and normal Slide File operation. The tablet is divided into two basic areas, one for drawing and the other for control. The whole of the tablet is electronically scanned and when the pen is pressed onto its surface the software interprets whether the position specified is a control or drawing command. The position of the pen in the drawing area is represented by a cursor on the television screen; this can be switched off if on-air drawing is required. The active drawing area (500 x 500 mm) is normally scaled to correspond with a full television picture, but this can be enlarged to draw fine detail on a selected part of a picture as required.

The control area contains approximately eighty separate selectable instructions and these have been arranged in specific groups, as advised by Graphic Design staff in Bristol, so as to be most conveniently placed from the artist's point of view. Many of the functions can be made repetitive, once selected, merely by successively pressing the pen on the tablet.

The VDU

Apart from displaying informative messages, the vdu plays little part in the normal operation of the system. Each time a control command is issued the screen will state what this is and, where relevant, provide additional information such as what percentage of RGB components are being used at any time so that these may be noted and repeated for future use. This is supported by a facility for 'legalising' colours which extend beyond the permitted range for television transmission.

The vdu also displays a 'BUSY' message whilst an operation is in progress, the pen becoming inoperative for this

period; this is to reassure the operator that the system is operating normally and that the pen function will be restored when the 'BUSY' message is removed.

Some of the Many Facilities

Full use can be made of the Slide File 'polyphoto' display and finished artwork can be recorded in digital YUV form on to a streaming tape cartridge for transfer to another Art File/Slide File or for archival purposes.

Important features are:

8-bit linear keying, enabling text (from an external character generator) to be superimposed with high quality.

The ability to perform changes in size, shape and rotation without significant alias effects occurring.

A full-colour palette, which can be accessed at will, and a variety of 'brushes' including air-brush and chalky effects.

Automatic drawing of straight lines, circles, ellipses and rectangles from two or three specified points.

Automatic colour fill within defined boundaries.

Automatic vertical/horizontal reflection of selected part of picture.

Shaded box effect, enabling rectangular areas to be shaded in any direction from one colour to another.

AudioFile in Bristol

A new facility in Bristol will make post-production dubbing of PSC and ENG material much quicker and easier. Known as AudioFile, it is a sophisticated digital audio editing system that may make multi-tracking and the razor blade things of the past. The Bristol AudioFile has been installed in 5

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The AudioFile installed in Bristol

AudioFile

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Tyndalls Road, in a new suite created from three old offices in the film storage area.

In the move towards electronic production from film, a lot of emphasis has been placed on the video side of the editing process, but editing of the sound has been restricted due to the poorer quality of the original U-Matic sound track, which quickly deteriorates with multiple dubbing. A digital solution to this problem has been found in AudioFile, which has a host of extra facilities as an added bonus.

AudioFile is manufactured by AMS, who are probably better known for the digital delay lines found in many sound studios. Two Winchester discs, each with a capacity of 370 Mbytes, form the storage medium, with a maximum of two hours forty minutes recording using 16 bits and a 32kHz sampling rate. The discs are driven by a microprocessor, which also communicates via a serial link with the control panel. The Audiofile is mounted in an AMEK BCII Studio Console, bought off-the-shelf because it contains a standard 19-inch rack space in which the control surface is mounted. The desk is configured as a 12-channel, 4-group mixer, with comprehensive patching and monitoring facilities.

A central feature of the AudioFile control panel is a small VDU that can operate in three modes. This allows the operator to label pieces of material uniquely, display edit cues, and move material in real time to coincide with the edit points. Full time-code facilities are displayed as well as date and real time. The display is controlled via function keys located around the VDU display. A full QWERTY keyboard is supplied to enable details to

be entered, and rock-and-roll facilities are also included.

The operation of the system is complex, but is very user friendly. Additional software has been developed by AMS to a BBC specification, and has been de-bugged as problems have appeared. The edited version of the video from the PSC or ENG original is brought to the dubbing suite, where the sound tracks are copied against timecode into the AudioFile via an A/D converter and stored on the Winchester disc. A small cubicle next to the dubbing room allows the presenter/narrator to add or re-record the sound track, and this is also stored in the AudioFile; any sound effects or background music are similarly stored. Using the VDU and control panel, the operator can then manipulate the various sources until the desired mix has been achieved. Because the sources are all stored in a digital domain, staff can change at will sequences, edit points, lip syncs or cues without degrading the output.

The final mix-down is recorded onto either a twin Nagra-T with centre track time-code for subsequent lay back to Umatic, or straight onto the video-edited master. The BVU 850SP high-band Umatic, with Dolby B, is remotely controlled from the AudioFile operating surface. The Nagra-T and the AudioFile synchronise the timecode from the Umatic.

Allan King from Film Unit, P & ID Tel, who was responsible for the project, said "The decision by Bristol to let an AudioFile be installed, instead of conventional facilities, was far sighted in view of the incomplete software available at that time. However, we have worked very closely with AMS, and are delighted with the speed with which they can de-bug the software; for example, some problems were presented on a Monday, and the revised software was installed and checked by the Friday of the same week."

"The local staff are delighted with the new installation," said Audio Manager Allen Harris, "for a long time the post-production sound side of ENG and PSC operations has lagged behind the video, but at last we can offer programme makers a high-quality service with a rapid turnaround."

The AudioFile in Bristol, joins others in service in Television Centre, Manchester and Television Film Studios.



The AudioFile control panel

A Wideband VHF Aerial from Research Department

By international agreement the vhf-fm band in the UK (88-108 MHz) has been allocated for use by radio broadcasting. Tests on commercially available aerials, and on a design for home constructors recommended by EID, revealed that few, if any, aerials covered the whole frequency band. Therefore Research Department were asked to produce a design that could be offered to home constructors and to professional manufacturers alike. The design should provide adequate gain and directivity across the whole of the 88-108MHz band.

A Yagi aerial was therefore developed by Research Department using computer modelling techniques. A Yagi design was preferable as it has only one driven element and thus is relatively easy to construct. Also, the design was limited to 4 elements because of its size. Scale-model aerials were built and measured to verify the predicted performance, and from this a full-size version of the design was built and measured.



The experimental Yagi built at Research Dept

Designing a Yagi aerial to cover the full band involves a drop in gain, but this is partially offset by keeping mismatch losses low. Although a compensating network reduces the mismatch loss, it increases the complexity of the design slightly. However, the new aerial covers full band with a similar performance to the old BBC design and has been recommended as a replacement for it. E.I.D. will issue a new information sheet suitable for home constructors, and the design offered to manufacturers under licence.

The full-size experimental aerial was built from aluminium tube. This has several disadvantages since the materials are not readily available to the

home constructor, they cannot be soldered, they oxidise and will not bend easily. Another version of the aerial was built using 15mm and 22 mm copper tube and standard plumbing fittings, as shown in the photograph. The copper aerial, although heavier, has the same performance as the aluminium aerial and is easier to build.

RADIO YORK CHANGES FREQUENCY



Miss Radio York, Miss Scarborough and Miss Scarborough Evening News change frequency at Oliver's Mount

SCAR - Continued from Page 3

service in mid-December. This date was chosen to enable the SCAR operators the Christmas period, a fairly quiet time for Tel. News, to become familiar with the new control area. The change-over took place between 8pm Saturday night and 7am Sunday morning. (The group photo was taken at 6.30am after the successful night's work.)

The new control area includes the following: the main desk, check desk, monitor stack, the associated bay mounted systems and jackfields; together with a three position combined EMX and control-line router with its equipment housed in a basement room. The EMX was installed by Nigel Walsh of P&ID Tel and was evolved from similar systems in service in Cardiff and Leeds. The control-line router "piggy-backs" the EMX so that it can share the same desk panels. This improves the routing operation and saves desk space.

Other members of the P&ID Tel team included engineers Maurice Greenberg, Narinder Chander, Paul Baynton, Julian Knight and technicians Les Cussans and Peter Volent. The refurbishment of SRU and FTT were carried out by Nigel Walsh and Paul Baynton respectively.

By Paul Drewett

Swain's Lane Refurbished

Television OBs permanent shf receiving site at Swain's Lane in North London has recently been refurbished by TCPD. This location provides a line-of-sight signal path to the north of London and the high ground in the surrounding counties, enabling OB and ENG contributions to be beamed from vehicle roofs, extendable towers, and roof tops.

The mast at Swain's Lane is equipped with five rotatable 4ft diameter parabolic aerials, each of which can be panned to most bearings by control equipment in the mast base building. Three of these aerials, currently working at 7 GHz, will be modified to work at 5.5 GHz as well - a new frequency band recently made available to the BBC.



The new control room at Swain's Lane

The old control room had been in service for 20 years and most of the equipment was obsolete and provided limited monitoring and test facilities. The new control room features a more ergonomic desk layout, with sound and vision test positions duplicated on each half of the desk. This enables two operators to handle simultaneous OBs independently, with common facilities mounted centrally. The output of Swain's Lane is fed to Broadcasting House Switching Centre. Control of the south London OB receiving site at Crystal Palace is also extended to Swain's Lane so that the OB engineers there can rotate the Crystal Palace aerials and check the performance of the OB circuits before handing them on to the network.

The installation caters for the new generation of SHF radio link equipment, the MCL Mk III. These units are frequency agile, which improves their versatility in terms of the format of reserve units. The

head units, which convert the SHF signal to an intermediate frequency, are mounted in the lines termination room. Each position provides a different filtered channel to each of the aerials via a chain of circulators. The head units, designed originally for mounting in the field, are mounted on the bays as required.

The intermediate frequency is then fed by triax cable to the MK III control units which are housed in purpose-built shelves in the control room bays.

The video and audio routings, both for the line feeds and monitoring, are centred on a Probel 7452 matrix providing 16 x 20 for video switching, and 32 x 24 for audio. All the video sources (ie receiver outputs) have dedicated picture monitors arranged in a stack, so that the main and standby channels are above one another - an aid to isolating link faults.

Beneath each monitor is an alphanumeric display into which the name of the OB site and its channel number can be typed. This 'labelling' is also held in software associated with the matrix which can be displayed on either of the desk monitors.

The design and installation was carried out by Mike Stead and Shah Irani, and the project led by Mike Robinson (all of TCPD). Gary Jay (Tel OBs) and Mike Stevens (Tel Projects) represented the user department. Other contributors included ACED, Communications Dept. and P & ID Tel.



Swain's Lane OB receiving site