

# Final Programme of Technical Sessions

The number appearing alongside the title of the contribution refers to the page in the Convention on which the text commences.

- \* denotes sessions to be held in the Grote Zaal
- † denotes sessions to be held in the Blauwe Zaal
- ▲ denotes publication only papers, not presented
- denotes papers not available at time of publication

## Saturday 4 July

- \* 10.00 hrs **SESSION 1**  
OPENING OF IBC 92  
TECHNICAL PROGRAMME  
*Welcome by R C Hills, Chairman,  
Technical Programme Committee, UK*
- Opening Address:**  
**'Enhanced wide-screen in Europe - why?'**  
*J C McKinney,  
ATSC, Chairman, USA*
- Keynote Addresses from the following industry personalities:**
- 553 **'16:9 Format of the future'**  
*P Groenenboom,  
Philips International BV, The Netherlands*
- 556 **'PALplus – terrestrial wide screen right on track'**  
*A Ziemer, ZDF, Germany*
- 563 **'Digital television broadcasting – Dreams, Decisions and Destinies'**  
*K P Davies,  
Canadian Broadcasting Corporation, Canada*
- **'Community policy for the introduction of advanced television services in Europe'**  
*E Lalor,  
European Community, Brussels*
- **'Towards Tomorrow's TV – are we really moving forward?'**  
*K H Barratt, Sony Broadcast and  
Communications, UK*
- 12.30 hrs **CLOSE OF SESSION AND LUNCH INTERVAL**

# Final Programme of Technical Sessions

Saturday 4 July (continued)

- \* 14.00 hrs **SESSION 2A**  
HD SYSTEMS I  
*Chairman: S N Baron, USA*
- 1 'HDTV broadcasting: The choices'  
*M D Windram and G M Drury*  
National Transcommunications Ltd, UK
- 9 'Development of HDTV digital transmission system'  
*E Nakasu, H Imaizumi, H Fujio and Y Ohtsuka*  
NHK, Japan
- 'A new generation of HDMAC encoder'  
*J Chatel, H Denieul, P Guillotel, C Blaize and P R Rogel*  
Thomson CSF/LER, France
- ▲ 'Design of an HDTV codec for terrestrial transmission at 25 Mbit/s'  
*P Weiss, B Christensson, J Arvidsson and H Andersson*  
Digital Vision, Sweden  
*G Petrides and C Foster*  
Vistek, UK
- 15.30 hrs **CLOSE OF SESSION AND TEA**
- 16.00 hrs **SESSION 3A**  
HD STANDARDS CONVERSION  
*Chairman: Dr G Tonge, UK*
- 51 'Standards conversion between 1250/50 and 625/50 TV systems'  
*V G Devereux*  
BBC Research Department, UK
- 56 'Experience with a prototype motion compensated standards converter for down-conversion of 1125/60/2:1 SMPTE-240M high definition to 625/50/2:1 video'  
*J W Richards, S M Keating, N I Saunders and C W Walters*  
Sony Broadcast and Communications Ltd, UK
- 62 'Motion compensated processing for enhanced slow-motion and standards conversion'  
*H Lau*  
BBC, UK  
*D Lyon*  
Snell and Wilcox Ltd, UK
- 'Standards conversion: High performance systems for TV and HDTV'  
*J Chatel, G Briand, B Garnier, L Jardin, Y Oliver and A Verdier*  
Thomson CSF/LER, France
- 18.00 hrs **CLOSE OF SESSION**

- + 14.00 hrs **SESSION 2B**  
RF HARDWARE  
*Chairman: P Douglas, UK*
- 18 'The flexible use of new high efficiency power amplification systems'  
*D B Freeman*  
Television Technology Corporation, USA
- 22 'Initial operating experience with IOT equipped UHF transmitters'  
*N S Ostroff*  
Comark Communications Inc, USA
- 29 'Development of high power medium-wave radio transmitter with SIT'  
*T Yamaguchi, H Naka, Y Nasu, K Hayeiwa and T Miyazaki*  
Japan Broadcasting Corporation, Japan
- 34 'Using monopole elements to increase pattern versatility in television slot antennas'  
*G Best and R Niekamp*  
Harris Allied Broadcast Division, USA
- 41 'The worlds first high power frequency-agile all-solid state, mobile medium wave transmitter'  
*J Malec, H Swanson and O Sablić*  
Harris Corporation, USA and Riz, Croatia
- 45 'The IOT - a new, environmentally-friendly tube for UHF television transmitters'  
*G T Clayworth, H P Bohlen and R Heppinstall*  
EEV Ltd, UK
- 15.30 hrs **CLOSE OF SESSION AND TEA**
- 16.00 hrs **SESSION 3B**  
RF HARDWARE  
*Chairman: C Cluniat, France*
- 67 'The Philips depressed collector 30/40 kw air cooled klystron'  
*S Grote*  
Philips Semiconductors, Germany
- 72 'Solid state television transmitters, performance and correction'  
*D A Culling*  
Harris TVT, UK
- 81 'Dynamic carrier control – Indian Scenario'  
*R Narasimha Swamy and N Srinivasan*  
All India Radio, India
- 86 'Helping blind people to watch television – the AUDELTEL project'  
*N K Lodge and J N Slater*  
Independent Television Commission, UK
- ▲ 'Three dimensional pattern analysis'  
*T J Vaughan*  
Micro Communications Inc., USA
- ▲ 'Antenna shielding for the protection of engineering personnel'  
*G E Hatfield and A J McCarthy*  
Telecom Australia, Australia
- ▲ 'The use of TV signals as a frequency reference of synchronous transmitters'  
*Shen Yun*  
Broadcasting and Television Bureau of Guizhou, China
- 18.00 hrs **CLOSE OF SESSION**

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Sunday 5 July

- \* 09.00 hrs **SESSION 4A**  
RECORDING I  
*Chairman: J Heitmann, Germany*
- 107 'Accelerated life testing of metal particle tape'  
*F Morrison and J Corcoran*  
Amplex Recording Systems Corporation, USA
- 112 'A codec for digital studio recording of HDTV'  
*P Kauff, P Stammnitz and R Schäfer*  
Heinrich-Hertz-Institute, Germany
- 117 'Considerations in the use of super 16 mm film for the production of wide-screen television programming'  
*M P Clark, C B Hunt, J W Johnston and W C Snyder II*  
Eastman Kodak Company, USA
- ▲ 'Storage stability of professional video metal tapes'  
*Y Yamamoto, K Sumiya, F Hayama, T Sueyoshi, Y Senzai and H Satoh*  
Hitachi Maxell Ltd, Japan
- 10.30 hrs **CLOSE OF SESSION AND COFFEE**
- 11.00 hrs **SESSION 5A**  
RECORDING II  
*Chairman: A Todorovic, Yugoslavia*
- 155 'A new 8-14 channel coding for high density recording'  
*T Uehara and Y Oba*  
NHK Science & Technical Research Labs, Japan
- 160 'PALplus in the home'  
*C Schepers, Nokia, Germany*  
*M Silverberg, Grundig, Germany*  
*T Viek, Philips Consumer Electronics, The Netherlands*  
*D Westerkamp, Thomson, Germany*
- 165 'Concept behind 1/2" digital component Video Recorder with D3 playback compatability'  
*R T Scott, Panasonic Broadcast Europe, UK*  
*K Suesada, Matsushita Electrical Industrial Co, Ltd, Japan*
- 571 'Bit rate reduction – the key to a new era in digital video recording'  
*J Ive and D Huckfield*  
Sony Broadcast and Communications, UK  
*K Kaminaga*  
Sony Corporation, Japan
- 12.30 hrs **CLOSE OF SESSION AND LUNCH**
- † 09.00 hrs **SESSION 4B**  
ROUTING  
*Chairman: G DePriest, USA*
- 127 'Optical routing for TV Studio centres-paper study to pilot system'  
*A Oliphant, R P Marsden, J C Newell and J T Zubrzycki*  
BBC, UK
- 132 'SOPHI – A serial optical HDTV interface for 1.2 Gbit/s'  
*J Fischer and J Jost*  
BTS Broadcast Television Systems GmbH, Germany
- 137 'Transmission system for analogue HDTV components and analogue audio signals on one singlemode fibre'  
*X Guillon, C Claverie, P Bouvet, D Thepaut, X Hergault and P LeRoux,*  
Thomson-CSF/LER, France
- ▲ 'Current developments in the ESBUS/ESnet broadcast remote control'  
*P H Jarrett*  
BBC, UK
- ▲ 'The MUSICAM – TAXI system'  
*B Burkhardtmaier,*  
Dialog4 System Engineering GmbH, Germany
- 10.30 hrs **CLOSE OF SESSION AND COFFEE**
- † 11.00 hrs **SESSION 5B**  
SYSTEMS AND CONTROL  
*Chairman: J A Flaherty, USA*
- 172 'Run VT' Voice control of broadcast systems'  
*J S Nunn, D J King and R H Spencer*  
BBC, UK
- 177 'Towards transmission in the 21st century'  
*K E L Jones and M S Tooms*  
TV3 Broadcasting Group Ltd and Michael Tooms Associates, UK
- 182 'System design considerations for the digital routing switcher at the Canadian Broadcasting Centre'  
*A B van Kesteren,*  
Canadian Broadcasting Corporation, Canada
- 188 'Simultaneous transmission system for two video signals'  
*Y Itoh, K Enami, Y Ninomiya, S Shimoda, Y Hoshino and T Suzuki*  
NHK Science & Technical Research Labs, Japan
- ▲ 'Distributed broadcasting control system using LAN'  
*K Inoue*  
NHK, Japan
- 13.00 hrs **CLOSE OF SESSION AND LUNCH**

# Final Programme of Technical Sessions

- \* 13.30 hrs **SESSION 6A**  
ENHANCED SYSTEMS  
*Chairman: G T Waters, Switzerland*
- 198 **'Agreeing worldwide standards for enhanced television'**  
*D Wood*  
European Broadcasting Union, Switzerland
- 203 **'PALplus – The European system for wide-screen terrestrial TV'**  
*A Ebner, Institut für Rundfunktechnik, Germany*  
*R Morcom, UKIB, UK*  
*R Ochs, Nokia Consumer Electronics, Germany*  
*U Riemann, Thomson Consumer Electronics, Germany*  
*M Silverberg, Grundig EMV, Germany*  
*R Storey, BBC, UK*  
*F Vreëswijk, Philips Research, The Netherlands*  
*D Westerkamp, Thomson-Consumer Electronics, Germany*
- 208 **'Enhanced PAL in the UK – A strategy for success'**  
*C Dalton, ITV Association, UK*  
*P Gardiner, Independent Television Commission, UK*  
*R Morcom, National Transcommunications Ltd, UK*
- 214 **'The use of studio clean-PAL techniques to feed enhanced distribution systems'**  
*G A Thomas*  
BBC Research Department, UK
- 219 **'The transmission of PALplus'**  
*P Blakeborough, UKIB, UK*  
*M G Croll, BBC Research Department, UK*  
*J Curtis, UKIB, UK*  
*U Riemann, Thomson Consumer Electronics, Germany*  
*E Sipek, Institut für Rundfunktechnik, Germany*  
*J Y Tichelaar, Philips, The Netherlands*
- 16.00 hrs **CLOSE OF SESSION AND TEA**
- \* 16.30 hrs **SESSION 7A**  
CABLE  
*Chairman: Dr R Blakeway, UK*
- 237 **'Digital transmission in 16 QAM format over cable and alternate media'**  
*J B Waltrich and J B Glaab*  
Jerrold Communications, USA
- 241 **'HDMAC Transmission, a balance between cable and satellite'**  
*A M Velders*  
Philips Nederland BV, The Netherlands
- 246 **'Remote monitoring of cable TV headends'**  
*R Bullinger*  
Hewlett-Packard Company, USA
- 251 **'Key words about encryption, MAC and CATV'**  
*F J W van Let*  
NV Casema, The Netherlands
- ▲ **'Developments towards the introduction of a multipoint video distribution service (MVDS) at 40 GHz within the United Kingdom'**  
*K Yard*  
Radiocommunications Agency, UK
- 18.30 hrs **CLOSE OF SESSION**
- † 14.00 hrs **SESSION 6B**  
ENCRYPTION I  
*Chairman: J Anderson, Republic of South Africa*
- 224 **'Scrambling and controlling access to an all-digital broadcast programme'**  
*D Angebaud and J-L Giachetti*  
CCETT, France
- 229 **'Access control requirements in a mature pay television industry'**  
*K Kelkar*  
General Instrument Corporation, USA
- 232 **'Successful Pay-TV systems'**  
*W Mooij and R van den Bogaardt*  
Irdeto Consultants, The Netherlands
- 15.30 hrs **CLOSE OF SESSION AND TEA**
- † 16.00 hrs **SESSION 7B**  
TRANSMISSION COVERAGE  
*Chairman: J Doeven, The Netherlands*
- 260 **'Digital audio broadcasting: experimental result of the coverage obtained using the COFDM system'**  
*M C D Maddocks*  
BBC Research Department, UK
- 265 **'UHF television reception: ghost images from very large buildings'**  
*D T Wright and D R Cornell*  
BBC Research Department, UK
- 270 **'DAB: Digital Audio Broadcasting coverage aspects of a single frequency network'**  
*C P Bell and W F Williams*  
BBC Research Department, UK
- 277 **'Frequency allocation options and planning for digital radio broadcasting'**  
*F Conway*  
Canadian Broadcasting Corporation, Canada
- ▲ **'Digital terrestrial transmitter networks for radio and TV'**  
*F Müller-Flömer*  
Bayerischer Rundfunk München, Germany
- 18.00 hrs **CLOSE OF SESSION**

# Final Programme of Technical Sessions

Monday 6 July

* 09.00 hrs	<b>SESSION 8A</b> OUTSIDE BROADCAST I <i>Chairman: Professor U Messerschmid, Germany</i>	† 09.00 hrs	<b>SESSION 8B</b> SATELLITE I <i>Chairman: M Tooms, UK</i>
295	<b>'The use of spread-spectrum techniques to provide ancillary service audio channels in the UHF broadcast band'</b> <i>C E Melvin, N J Laffin and M C D Maddocks</i> BBC Research Department, UK	311	<b>'140 Mbit/s HD-MAC codec'</b> <i>M Gendsior, G Schmidt, J Wenger and G Zimmermann</i> Philips Kommunikations Industrie AG, Germany
300	<b>'Outside broadcast communications: - Towards a greener use of the radio frequency spectrum'</b> <i>G J Wimpenny, P N Moss and J B Sykes,</i> BBC, UK	317	<b>'Transmission of HDMAC via communication satellites'</b> <i>W Dobbie, BT, UK</i> <i>M Harverson, Eutelsat, France</i> <i>J Veillard, CCETT, France</i>
306	<b>'Ancillary communications for SNG/OB terminals'</b> <i>A R Lewis and J M C Scott</i> BBC, UK	321	<b>'Results achieved with transmissions of HDMAC during the last two years'</b> <i>H C Needs</i> Philips Consumer Electronics BV, The Netherlands
10.30 hrs	<b>CLOSE OF SESSION AND COFFEE</b>	10.30 hrs	<b>CLOSE OF SESSION AND COFFEE</b>
11.00 hrs	<b>SESSION 9A</b> OUTSIDE BROADCAST II <i>Chairman: G Stephens, UK</i>	† 11.00 hrs	<b>SESSION 9B</b> SATELLITE II <i>Chairman: to be confirmed</i>
327	<b>'Compact and light SNG unit based on digital compression techniques'</b> <i>H Okamura</i> NHK, Japan	339	<b>'Digitalisation of the eurovision network The first step: Eutelsat II'</b> <i>L Cheveau and D R Miles</i> European Broadcasting Union, Switzerland
332	<b>'The implementation and testing of a switching radio-camera system'</b> <i>R H Evans</i> BBC Research Department, UK	344	<b>'Satellite TV – The next thirty years'</b> <i>J S Lothian and B H Beech</i> National Transcommunications Ltd, UK
336	<b>'Vision 1250, its fleet and the Olympics'</b> <i>F Visintin</i> Vision 1250, Belgium	350	<b>'Integrated services digital broadcasting (ISDB)'</b> <i>T Yoshimura, N Kawai, E Nakasu and T Isobe</i> NHK, Japan
12.30 hrs	<b>CLOSE OF SESSION AND LUNCH</b>	▲	<b>Flat printed zone plate antennas for DBS reception'</b> <i>Y J Guo and S K Barton</i> University of Bradford, UK
		13.00 hrs	<b>CLOSE OF SESSION AND LUNCH</b>

# Final Programme of Technical Sessions

- \* 13.30 hrs **SESSION 10A**  
DIGITAL CODING  
*Chairman: N Smuts, Republic of South Africa*
- 359 **'Digital terrestrial television development in the SPECTRE project'**  
*A G Mason*  
National Transcommunications Ltd, UK  
*N K Lodge*  
Independent Television Commission, UK
- 367 **'VADIS – Digital Television at under 10 Mbit/s'**  
*K McCann*  
National Transcommunications Ltd, UK
- 372 **'STERNE: the CCETT proposal for digital television broadcasting'**  
*P Bernard*  
CCETT, France
- 375 **'Digicipher: An update on progress made in the US'**  
*K Kelkar*  
General Instrument, USA
- 380 **'Digital television broadcasting with high spectral efficiency'**  
*R Monnier, J B Rault and T de Couason*  
Thomson-CSF/LER, France
- 16.00 hrs **CLOSE OF SESSION AND TEA**
- \* 16.30 hrs **SESSION 11A**  
ENCRYPTION II  
*Chairman: to be confirmed*
- 405 **'BBC Select: A terrestrial subscription television service'**  
*D J M Kitson*  
BBC Subscription Television, UK  
*C K P Clarke*  
BBC Research Department, UK
- 410 **'The BBC select decoder'**  
*J Saini*  
Thomson Consumer Electronics R&D, France
- 414 **'D2-MAC/Packet and Eurocrypt: Advanced solutions for innovative pay-tv and pay-per-view services'**  
*J P Coustel*  
France Telecom, France
- ▲ **'Smart cards exclusive advantages in pay-TV'**  
*G Monnin*  
Schlumberger, France
- 18.00 hrs **CLOSE OF SESSION**
- † 14.00 hrs **SESSION 10B**  
ORIGINATION I  
*Chairman: B Baldry, Canada*
- 385 **'Adaptive concealment of data in Nicam signals'**  
*J R Emmett*  
Thames Television plc, UK
- 390 **'Applications of motion compensation to standards conversion and film transfers'**  
*B R Mason and R N Robinson*  
Vistek Electronics Ltd, UK
- 395 **'Simulation of a texture synthesizer for HDTV production'**  
*M Rebiaï and F Pinson*  
Thomson Broadcast, France  
*A Smolarz and H Pavie*  
CNRS, France
- ▲ **'Producing a very high quality still image from HDMAC transmission'**  
*M Helsingius, O Kalevo, P Haavisto and Y Neuvo*  
Tampere University of Technology, Finland
- 15.30 hrs **CLOSE OF SESSION AND TEA**
- † 16.00 hrs **SESSION 11B**  
ORIGINATION II  
*Chairman: Dr J R Forrest, UK*
- 422 **'Fold It or fix It: The changing face of special effects'**  
*M Stein*  
Ampex Corporation, USA
- 427 **'Motion vector based interpolation techniques for flicker-free TV reproduction'**  
*M Botteck*  
Universität Dortmund, Germany
- 432 **'Studio aspects for PALplus production'**  
*C J Dalton*  
Independent Television Association, UK  
*W Hüppe*  
Westdeutscher Rundfunk, Germany
- 17.30 hrs **CLOSE OF SESSION**

# Final Programme of Technical Sessions

Tuesday 7 July

- \* 09.00 hrs **SESSION 12A**  
CAMERA I  
*Chairman: Dr I Childs, UK*
- 438 **'Image distortion from zoom lenses: Modeling and digital correction'**  
*M Rebiai, S Mansouri, F Pinson and B Tichit*  
Thomson Broadcast, France and  
Université de Technologie de Compiègne, France
- 442 **'Digital signal processing technology for broadcast cameras'**  
*T Asaida, T Kihara, H Murayama and M Naito*  
Sony Corporation, Japan  
*S Morikawa and I Sheldon*  
Sony Broadcast and Communications Ltd, UK
- 448 **'New international standard for the interface lens/camera for 1" HDTV CCD cameras'**  
*P Böhler*  
Norwegian Broadcasting Corporation, Norway
- 10.30 hrs **CLOSE OF SESSION AND COFFEE**
- \* 11.00 hrs **SESSION 13A**  
CAMERA II  
*Chairman: R Ellis, UK*
- 474 **'Digital automatic pixel correction in new generation CCD cameras'**  
*B Botte,*  
Thomson Broadcast, France
- 479 **'A two million pixel fit CCD camera for HDTV'**  
*R Lewis,* Sony Broadcast and Communications, UK  
*K Ishikawa, T Iizuka and N Nishi,*  
Sony Corporation, Japan
- 488 **'HDTV image sensor: the pixel structure'**  
*A Theuwissen, H Peek, P Centen, M van de Steeg,*  
*R Boesten, P Hartog, A Kokshoorn, E de Koning,*  
*J Oppers and F Vledder*  
Philips Research Labs, The Netherlands
- 492 **'A high performance full bandwidth HDTV, camera applying the first 2.2 million pixel FT-CCD sensor'**  
*J Blankevoort, P Brouwer, B van den Herik,*  
*J van Rooy*  
BTS Broadcast Television Systems BV,  
The Netherlands
- 13.00 hrs **CLOSE OF SESSION AND LUNCH**
- + 09.00 hrs **SESSION 12B**  
MEASUREMENTS I  
*Chairman: P Laven, UK*
- 456 **'Error measurements and analysis of Serial CCIR- 601 equipment'**  
*B Elkind, K Ainsworth, D Fibush, R Lane and M Overton*  
Tektronix, Inc., USA
- 461 **'A fast method for evaluating control room performance using maximum length sequences'**  
*A Munro*  
Munro Associates, UK
- 466 **'Tools for the validation of conditional access functions in eurocrypt'**  
*J P Héon*  
CCETT, France
- ▲ **'Television picture impairments'**  
*B W Osborne*  
Consultant, UK
- 10.30 hrs **CLOSE OF SESSION AND COFFEE**
- + 11.00 hrs **SESSION 13B**  
MEASUREMENTS II  
*Chairman: C Rhodes, USA*
- 498 **'A quality of service view of digital television network distribution'**  
*A Rayner*  
BT Labs, UK
- 504 **'The development and evaluation of an objective video quality assessment system that emulates human viewing panels'**  
*S D Voran and S Wolf*  
Institute for Telecommunication Sciences, USA
- 509 **'Feature verification and quality measurement in D2-MAC systems'**  
*E Kraemer*  
Rohde & Schwarz, Germany
- 513 **'Experiences with multi-format HDTV testing'**  
*K Field*  
Canadian Broadcasting Corporation, Canada
- ▲ **'Luminant test signals for fully characterizing component based transmission systems'**  
*C W Rhodes*  
Advanced Television Test Center, Inc., USA
- 13.00 hrs **CLOSE OF SESSION AND LUNCH**

# Final Programme of Technical Sessions

Tuesday 7 July (continued)

- \* 14.00 hrs **SESSION 14A**  
HD SYSTEMS II  
*Chairman: G T Waters, Switzerland*
- 523 **'HDTV: A 140 Mbit/s codec for "contribution" quality coding'**  
*A D R Cotton and N D Wells,*  
BBC Research Department, UK
- 528 **'Experiences with multichannel sound for HDTV'**  
*D G Kirby*  
BBC Research Department, UK
- 533 **'3D Hi-vision'**  
*H Yamanoue, M Tadenuma and I Yuyama*  
NHK Science & Technical Research Labs, Japan
- 538 **'Compatible wide-screen teletext for use with HDTV systems'**  
*G Möll*  
Institut für Rundfunktechnik, Germany
- 543 **'High performance coding systems for digital transmission of TV and HDTV signals'**  
*P Dumenil, C Perron and P Schwartz,*  
Thomson CSF/LER, France
- ▲ **'An equalizer for D2MAC/packet receivers'**  
*J P Bernoux, M Lanoiselée, J Palicot and J Veillard*  
CCETT, France  
*F Balestro, C Joanblanq, S Maginot, M Rémy*  
and *P Senn,*  
CNET, France
- 16.30 hrs **CLOSE OF SESSION AND TEA**



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