

CONTENTS

	Page
INFRA RED AND LOW LIGHT LEVEL IMAGING	
SESSION 1:	
Invited paper on IRCCD, "Infra-Red CCD Developments: Devices and Applications" B. R. Holeman (RSRE, Malvern, UK).	1
"Infrared Focal Plane Arrays for Planetary Space Missions: A Prospectus" J. B. Wellman (Californian Institute of Technology, USA).	13
"Near IR-AC Coupled CCD Detector Array" G. Domingo, M. D. Jack, J. Y. M. Lee (Hughes Aircraft, USA), V. T. Bly (US Army Night Vision & Electro-Optical Laboratories, USA).	21
SESSION 2:	
"Multiplexed High-Pass Filters for Infrared Signal Processing" M. K. Quick, D. J. MacLennan (GEC, USA).	27
"Mosaic CCD Multiplexer for Pyroelectric Hybrid Focal Plane" S. Iwasa, D. Lamb & D. Paffel (Honeywell, USA).	33
"CCD Detectors for Astronomy" B. Campbell (Canada Franch Hawaii Telescope Co.), A. Condal, G. Fahlman, P. Hickson, G. Walker (Geophysics and Astronomy Dept., U.B.C.), A. Lakshmi, R. Nicholls, H. Pritchard (Centre for Research, York University, Canada), C. Pritchett (DAO, Canada).	40
"Low Light Level CCD-TV" L. V. Caldwell, J. J. Boyle, A. J. Kennedy, W. Tardiff & S. Tomarchio (US Army Night Vision and Electro-optics Laboratory, USA).	45
"Microchannel Plate Wafer Image Tube Intensified Charge-Injection Device Cameras" C. B. Johnson, T. F. Lynch & J. J. Cuny (ITT, USA).	51
CAMERA AND VISIBLE IMAGING SYSTEMS	
SESSION 3:	
Invited paper "Advances in CCD Imagers" Y. Daiman-Hagiwara (Sony Corp., Japan).	57
"Colour-cameras Employing Two CCD/CID Imagers" U. Reimers (University of Braunschweig, Germany).	68
"Television Scanning of Colour Film" I. Childs (BBC Research Department, UK)	76
"Optical Smear in a Resistive Gate Sensor" T. J. Hazendonk & A. J. Klinkhamer (Philips Research Laboratories, The Netherlands).	82
SESSION 4:	
"100 x 100 CID Imager with Integrated Fixed Pattern Noise Suppression" R. Koch & Heiner Herbst (Siemens, AG, Germany).	92
"A Helmet Mounted Sight System" M. D. Stephenson & K. D. Fosberry (Marconi Avionics Ltd., UK).	98
"Applications of CCDs as Electron Detectors in Electron Microscopy" P. T. E. Roberts, A. M. MacLeod & J. N. Chapman (University of Glasgow, UK).	112

	Page
"Enhanced Optical Waveguide Focal Plane Resolution Utilizing a Channel Waveguide Fan-Out Array Coupled to an Integrated CCD" J. T. Boyd, D. A. Ramey & C. L. Fan (University of Cincinnati, USA).	118
"A One-Inch High Resolution Buttable Time Delay and Integrate Imaging BCCD" D. A. Smith, J. J. White, W. C. Bradley (Bell-Northern Research Ltd., Canada).	124
SIGNAL PROCESSING 1	
SESSION 5:	
Invited paper on "Charge Transfer Devices for Bandwidth Compression" R. D. Baertsch, W. E. Engeler, J. L. Hughes and J. J. Tiemann (General Electric, USA).	130
"A CCD Video Integrator" C. J. Oliver, J. R. Hill, A. H. James, D. V. McCaughan & R. Edwards (RSRE Malvern, UK).	140
"CCD Non-Linearities in MTI Receivers" T. Bucciarelli (University of Perugia, Italy), S. Cacopardi & G. Picardi (University of Rome, Italy).	146
"Performance Characteristics of a CCD Analog Memory/Signal Processor" C. Carrison & N. A. Foss (Honeywell Inc., USA).	156
Invited Paper "Design of Complex CCD/MOS Integrated Circuits" C. R. Hewes, R. C. Pettengill, P. W. Bosshart, R. K. Hester, D. J. Mayer, T. K. Hui (Texas Instruments, USA).	162
SESSION 6:	
"Fully-Integrated Charge-Coupled PCM Line Filters" W. J. Keutgens, R. R. Simons, G. J. Declerck (University of Leuven, Belgium) & E. J. Janssens (Bell Telephones, Belgium).	176
"CCD Filter for the PCM Codec" K. Knauer (Siemens AG, Germany).	182
"Design of Minimum Phase Charge-Transfer Transversal Filter" M. Feldman, J. Henaff & J. C. Rebourg (CNET, France).	192
"CCD Acoustic Signal Processor" E. J. Lind & I. Lagnado (NOSC, San Diego, USA).	198
"A CCD Phase Cancellation System for Single-Sideband Modulation" J. W. Pathuis, Hans Wallinga (Twente University of Technology, The Netherlands) & B. Ricco (University of Bologna, Italy).	205
SIGNAL PROCESSING 2	
SESSION 9:	
Invited paper "Programmable Transversal Filters: Design Tradeoffs" G. P. Weckler, M. D. Walby (EG & G Reticon, USA).	211
"Digitally Controlled and Electrically Programmable CCD Transversal Filter LSI" T. Sakaue, T. Iida, F. Tanaka, C. Satoh & Y. Suzuki (Toshiba Corp., Japan).	222
"A High Speed CCD Digitally Programmable Transversal Filter" A. M. Chiang, B. E. Burke, D. L. Smythe, D. J. Silversmith & R. W. Mountain (Massachusetts Institute of Technology, USA).	230
"A Fast 32 Point Analogue Correlator" J. C. White, J. M. Keen, M. F. Hamer, D. V. McCaughan & J. R. Hill (RSRE Malvern, UK).	237

	Page
"Design and Application of a Cascadable Binary Weighted Analogue Correlator" W. D. Pritchard & J. N. Gooding (Plessey Caswell Ltd., UK).	241
"A 512-Stage Analog-Binary Programmable Transversal Filter" J. R. Tower, D. A. Gandolfo, L. D. Elliot & B. M. McCarthy (RCA Advanced Technology Laboratories, USA), F. D. Shallcross (RCA Laboratories, USA) & S. C. Munroe (MIT Lincoln Laboratory, USA).	247
SESSION 10:	
"256-Point Programmable Transversal Filter" P. B. Denyer (Wolfson Microelectronics Institute, University of Edinburgh) & J. Mavor (Dept. of Electrical Engineering, University of Edinburgh).	253
"The Electrically Programmable Splitted-Electrode CCD Transversal Filter (EPSEF)" M. J. M. Pelgrom, H. Wallinga & J. Holleman (Twente University of Technology, The Netherlands).	254
"Adaptive Filtering in CCD and MOS Technologies" S. Sunter, A. Chowanec & T. Little (Bell Northern Research, Canada).	261
Invited paper "Performance Tradeoffs between CCD & Switched Capacitor Filters" R. W. Broderson and T. C. Choi (University of California, USA).	268
HIGH SPEED CCD AND TECHNOLOGY	
SESSION 11:	
Invited paper "Advances in High Speed CCDs" B. T. French (Rockwell, USA).	279
"High Speed CCD Signal Processing—A Technology Development" R. L. Angle (RCA, USA).	280
"259 Gate GaAs CCD Shift Register for High Speed Applications" I. Deyhimy, J. S. Harris, Jr., R. C. Eden & R. J. Anderson (Rockwell, USA).	287
"An All-Implanted CCD/CMOS Process" DeWitt Ong (Motorola, USA).	291
DIGITAL CCD	
SESSION 12:	
"Design of a 256 KBit CCD Chip" E. Doering (Siemens AG, Research Laboratories, Germany). E. Gottler, O. Grunter & J. Witte (Siemens, AG, Data Processing Division, Germany).	297
"A Model for Life Testing Buried Channel CCD Memories" K. Venkateswaran (Fairchild Semiconductor, San Jose, USA).	298
"The Application of CCDs in Multiple Valued Logic" H. G. Kerkhoff & H. Dijkstra (Twente University of Technology, The Netherlands).	304
"A Circulating Multilevel Charge Transfer Device Memory with Adaptive Refresher" A. H. M. van Roermund & P. M. C. Coppelmans (Philips Research Laboratories, The Netherlands).	310

POSTER PRESENTATIONS

SESSION 7:

- "The Switched Capacitor Filter is Revolutionising Low Frequency Filtering" 317
G. P. Weckler (EG & G Reticon, USA), & A. Buser (EG & G Reticon, Switzerland), A. M. Davis (Dept. of Electrical Engineering, San Jose State University, USA).
- "A Voiceband Hybrid CCD-Active Filter for Telecommunication Applications" 323
R. Benoit-Gonin, J. L. Berger, J. E. Picquendar, A. Vidal (Thomson CSF, France).
- "A CCD Bandwidth Compressor for Airborne Radar Applications" 328
J. C. White, J. G. Harp, J. R. Hill, D. V. McCaughan, J. M. Keen, CRSRE, Malvern UK).
- "CCD Based Analogue Adaptive Processing" 334
C. F. N. Cowan, J. Mavor (Dept. of Electrical Engineering, University of Edinburgh), J. W. Arthur & P. B. Denyer (Wolfson Microelectronics Institute, University of Edinburgh, UK).
- "50 MHz Time Delay and Integration CCD" 341
C. F. Walmsley (Wolfson Microelectronics Institute, University of Edinburgh, UK), J. N. Gooding (Plessey Co. Ltd., UK).
- "A Novel CCD for Fast Time Delay Within-Pulse Sector Scanning Sonars" 347
L. H. Ong, P. N. Denbigh (University of Birmingham, UK), J. G. Harp, J. M. Keen & T. Janes (RSRE, UK).
- "Charge-Coupled Device Image Processors for Electro-Optical Position Control" 353
R. W. Armstrong (Californian Institute of Technology, USA) & E. S. McVey (University of Virginia, USA).
- "Charge-Coupled Devices for Speech Transform Coding" 363
K. K. Patel (Chelsea College, University of London, UK), A. P. H. McCabe, D. J. Burt (GEC, UK) & K. V. Lever (Brunel University).
- "A CCD Adaptive Filter with Coefficient Compensation of Charge Transfer Loss" 370
G. D. Cain (Polytechnic of Central London, UK), V. Cappellini, E. Del Re, G. Fanfani, L. Fini (University of Florence, Italy).

SESSION 8:

- "Compact Helium Speech Unscrambler Using Charge Transfer Devices" 376
M. A. Jack, A. D. Milne (Wolfson Microelectronics Institute, University of Edinburgh, UK) & L. E. Virr (Portsmouth, UK).
- "Analysis of the Multiplication and Linear Integration Input Techniques to a CCD" 382
J. R. Hill, J. C. White, B. C. Merrifield, D. V. McCaughan (RSRE Malvern, UK).
- "Surface Potential Sensing Output Stage for CCDs" 385
M. Feil, M. Mauthe & H. J. Pfeleiderer (Siemens AG, Germany).
- "Harmonic Distortion in Split-Electrode CCD Transversal Filters" 390
J. L. Pennock & D. R. Lamb (University of Southampton, UK)

	Page
<p>"An Accurate Time-Domain Technique for Direct Measurements of the Effective Tap Weights in CCD Filters"</p> <p>S. Cova, A. Longoni (Milan Polytechnic, Milan, Italy), C. Morandi (University of Bologna, Italy) & F. Rossi (Montedison, Novara, Italy).</p>	396
<p>"Charge-Coupled Device Characteristics in Presence of Backward Flow"</p> <p>A. B. Bhattacharyya, S. C. Dutta Roy & L. Shankarnarayan (Indian Institute of Technology, New Delhi, India).</p>	402
<p>"Investigations about the Edge Effects in SCCDs"</p> <p>H. Klar, M. Mauthe & H. R. Deppe (Siemens AG, Germany).</p>	407
<p>"Computer Simulation of Charge-Coupled Devices"</p> <p>A. Cwik, G. S. Hobson, J. E. Sitch, C. R. Brewitt-Taylor & P. N. Robson (University of Sheffield, UK).</p>	412
<p>"Developments in CCD Modelling and Simulation Techniques"</p> <p>R. Michaelson, J. Mavor (University of Edinburgh, UK), G. Russell (Wolfson Microelectronics Institute, University of Edinburgh, UK) & J. Searle (Dept. of Applied Maths, University of Edinburgh, UK).</p>	418
<p>"Control of Threshold Non-Uniformities in Charge-Coupled Devices"</p> <p>N. A. Foss, W. Larson, C. Carrison (Honeywell Inc., Minnesota, USA).</p>	425
<p>"Low-Loss CCD Concept"</p> <p>W. F. Kosonocky & D. J. Sauer (RCA Laboratories, USA).</p>	431