

Proceedings

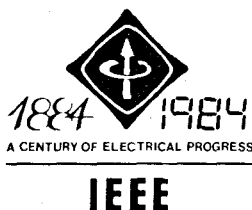
International Carnahan Conference on Security Technology

October 4-6, 1983

Editor
John S. Jackson

UKY BU132
October 1983

Publishing Editors
R. William De Vore, University of Kentucky
Pieter de Bruyne, Federal Institute of Technology



UNIVERSITÄTSBIBLIOTHEK
HANNOVER
TECHNISCHE
INFORMATIONSBIBLIOTHEK

Sponsored by:

- Schweizerischer Elektrotechnischer Verein

Organised jointly by:

- University of Kentucky
College of Engineering
Office of Engineering Continuing Education
- Swiss Federal Institute of Technology, Institute for Communication Technology

In Cooperation with:

- Institute of Electrical and Electronic Engineers, Inc.
Aerospace and Electronic Systems Society

Technical groups of the
Institute of Electrical
and Electronic Engineers,
Inc.

The opinions expressed in and the responsibility for the contents of articles herein published are those of the authors. Neither the University of Kentucky nor the Swiss Federal Institute of Technology makes any warranty, expressed or implied, or assumes any legal liability or responsibility for the accuracy, completeness or usefulness of any information, apparatus, product or process disclosed, or represents that its use would not infringe on privately owned rights.

Table of Contents

Tuesday, October 4, 1983

OPENING SESSION

	<i>Page</i>
Keynote Address:	1
D. Shaw, <i>Radcliffe Library, Oxford University, Oxford, UNITED KINGDOM</i> Security and the Individual	

SESSION A INTEGRATED SECURITY SYSTEMS; ACCESS CONTROL SYSTEMS

Session Chairman: F. Eggimann
Cerberus Ltd.
Männedorf, SWITZERLAND

Integrated Security System Definition	7
G. K. Campbell and J. R. Hall, II, <i>Analytical System Engineering Corporation, Burlington, Massachusetts, USA</i>	
Technical Methods to Optimize Protection against Sabotage and Theft	15
J. L. Darby, W. Thomas, E. Claiborne, P. Smith and S. Walker, <i>Science & Engineering Associates Inc., Albuquerque, New Mexico, USA</i>	
Computer Analysis of Security Systems	23
F. Peyron, <i>Simage SA, Les Trois Fontaines, FRANCE</i>	

SESSION B MONITORING, COMMAND AND CONTROL SYSTEMS

Session Chairman: Estelle Zannes
University of New Mexico
Albuquerque, New Mexico, USA

Computer-Aided Command and Control Centers for Police and Plant Security	31
P. Höhne, <i>Siemens AG, Munich, FEDERAL REPUBLIC OF GERMANY</i>	
Present and Future of Computerized Command and Control Systems for Fire Fighting Systems in Japan	41
T. Okada, A. Nishigouri and F. Egami, <i>Fujitsu Ltd., Tokyo, JAPAN</i>	
Security Systems and Building Automation	49
A. von Freydorf, <i>Merk Telefonbau GmbH, Munich, FEDERAL REPUBLIC OF GERMANY</i>	
The Pitfalls of Procuring Alarm Systems using Performance Specifications without Industry Coordination	55
J. W. Owen, <i>U.S. Army Countersurveillance Labs., Fort Belvoir, Virginia, USA</i>	

	Page
Enhancement of Direct and CCTV Surveillance/Assessment Functions at the Perimeter of Controlled Access Sites	63
F. P. Pfleckl, <i>Department of the Army</i> , Ft. Belvoir, Virginia, USA	
The Evolution of Passenger/Baggage Screening at Airports	69
J. K. Blank, <i>AVSEC, Inc.</i> , Washington, DC, USA	
An Application System for the Computer-Assisted Identification of Handwritings	75
V. Klement, <i>Bundeskriminalamt</i> , Wiesbaden, FEDERAL REPUBLIC OF GERMANY	

Wednesday, October 5th

**SESSION C
COMPUTER AND COMMUNICATIONS SECURITY**

Session Chairman: K. Hopper
Bell Telephone Laboratories
Holmdel, New Jersey, USA

Computer and Communication Systems Security: Policy Considerations in a Technological Age	81
L. G. Becker, <i>U.S. Library of Congress</i> , Washington, DC, USA	
Program Protection Techniques	89
Sin-Min Tsai, <i>National Taiwan Institute of Technology at Taipei</i> , Taiwan, REPUBLIC OF CHINA	
The Definition and Implementation of a Secure Communications Protocol	95
B. Chorley and G. I. Parkin, <i>National Physical Laboratories</i> , Teddington, UNITED KINGDOM	
Encryption Methods in Modern Data Communication Networks	103
W. R. Widmer, <i>Gretag</i> , Regensdorf, SWITZERLAND	
A Study of Wyner's Analog Speech Scrambling Schemes	107
P. Wah and P. Schöbi, <i>Swiss Federal Institute of Technology</i> , ETHZ, Zurich, SWITZERLAND	
Spectrally Efficient Transmission of Digitized, Encrypted Speech over Mobile Radio Channels	115
W. Braun, <i>Brown Boveri Co.</i> , Baden, SWITZERLAND	
Digital Data Transmission over Typical Voice Channels	123
M. J. Treado, <i>National Bureau of Standards</i> , Washington, DC, USA	

**SESSION D
PUBLIC KEY ENCRYPTION AND AUTHENTICATION**

Session Chairman: K. Widmann
Crypto AG
Zug, SWITZERLAND

Does Public-Key Cryptography Provide a Practical and Secure Protection of Data Storage and Transmission?	133
Y. Desmedt, J. Vanderwalle and R. Govaerts, <i>Katholieke Universiteit Leuven</i> , Leuven, BELGIUM	

	<i>Page</i>
Passwords Authentication Using Public-Key Encryption	141
Tai-Yang Hwang, <i>Institute of Information Industry</i> , Taipei, Taiwan, REPUBLIC OF CHINA	
Bullet Signature Identification Using Time Domain Computer Techniques	145
G. D. Arndt, J. H. Suddath and C. I. Soderland, <i>NASA</i> , <i>L. B. Johnson Space Center</i> , Houston, Texas, USA	
Color Test Equipment for Banknote Authentication	153
K. M. Jauch, <i>Sodeco SA</i> , Geneva, SWITZERLAND	
A System for Signature Analysis and Verification Based on an Accelerometer Pen	157
R. Plamondon, <i>Ecole Polytechnique</i> , Montreal, Ontario, CANADA	
Intelligibility Enhancement of Audio Tape Recordings	165
B. J. Blain, <i>Home Office</i> , St. Albans, UNITED KINGDOM	
Developments on Automatic Fingerprint Recognition	173
K. Millard, <i>Home Office</i> , London, UNITED KINGDOM	

Thursday, October 6th

**SESSION E
SENSORS AND INTRUSION DETECTORS**

Session Chairman: G. Linden

VdS

Cologne, FEDERAL REPUBLIC OF GERMANY

New Developments in Ultrasonic and Infrared Motion Detectors	179
P. Steiner and P. Wägli, <i>Cerberus Ltd.</i> , Männedorf, SWITZERLAND	
Sentrax—A Perimeter Security System	185
R. K. Harman, <i>Senstar Corporation</i> , Kanata, Ontario, CANADA	
Intrusion Detectors Testing Techniques	191
A. Biasiotti, <i>Lips Vago Elettronica SPA</i> , Milan, ITALY	
Vault Protection with Seismic Detector Systems	197
K. Gugolz and H. Eugster, <i>Cerberus Ltd.</i> , Männedorf, SWITZERLAND	
The Use of PERIFELD Under Extreme Atmospheric Conditions	203
P. Kupec, <i>Siemens AG</i> , Munich, FEDERAL REPUBLIC OF GERMANY	
Opportunities for Photoelectric Beams for Indoor and Outdoor Security	207
D. Andrew, <i>Arrowhead Enterprises Inc.</i> , New Milford, Connecticut, USA	
Advanced Pyroelectric Sensors for Passive Infrared Intruder Alarms	213
H. J. Keller, <i>Eltec Instruments SA</i> , Wallisellen, SWITZERLAND	

SESSION F
SENSORS, DETECTORS AND NEW CONCEPTS

Session Chairman: J. Chiba

Tohoku University

Sendai, JAPAN

	<i>Page</i>
Application of Fiber-Optic Technology in Security Systems	217
G. Pfister and H. Guettinger, <i>Cerberus Ltd.</i> , Männedorf, SWITZERLAND	
Fiber Optic Line Sensors	*
D. H. Rowe, <i>GTE Communications Products Corporation</i> , Mountain View, California, USA	
SECOP, An Optical Fibre System for Perimeter Protection	223
L. Saitta, <i>Cabloptic SA</i> , Cortaillod, SWITZERLAND	
A Pulsed-Doppler Ultrasonic Motion Detector for Limited Area Surveillance in an Unconfined Region	227
P. S. Excell and D. T. Kowalczyk, <i>Bradford University</i> , Bradford, UNITED KINGDOM	
Snow Rescue Operations Guided by an UHF Marker	233
J. Chiba, <i>Tohoku University</i> , Sendai, JAPAN	
The Nonlinear Junction Detector	239
S. W. Daskam, <i>Information Security Associates Inc.</i> , Stamford, Connecticut, USA	

*Published in Proceedings of the 1983 Conference on Crime Countermeasures and Security.

ADDITIONAL PAPERS

Compact Field Cable Antenna for Highway Advisory Radio	243
M. Suzuki, <i>Furukawa Electric Co., Ltd.</i> , Sendai, JAPAN	
Computerized Retrieval and Assignment of Fire Fighting Water Sources for Responding Fire Companies	247
M. Ota, <i>Osaka Municipal Fire Department</i> , Osaka, JAPAN; A. Nishigouri and F. Egami, <i>System Engineering Department, Fujitsu Ltd.</i> , Tokyo, JAPAN	
Cryptography Protects Information Against Several Frauds	255
Y. Desmedt, J. Vandewalle and R. Govaerts, <i>ESAT Katholieke, Universiteit Leuven</i> , BELGIUM	
The Vehicle Radar Detector Controversy: Is There a Technological Solution?	261
E. F. Greneker, <i>Georgia Institute of Technology</i> , Atlanta, Georgia, USA	
Law Enforcement Versus Computer Crime	267
R. J. Gallagher, <i>Consultant</i> , Bethesda, Maryland, USA	
Method Analysis and Synthesis of Access Control System	275
A. Bilbao, <i>ECl, Centro de Estudios y Análisis Penta Tres</i> , Madrid, SPAIN	