

**IFAC**  
INTERNATIONAL FEDERATION  
OF AUTOMATIC CONTROL

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Honorary Editor of IFAC

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# CONTENTS

	<u>Page</u>
IFAC NEWS	
- Third Congress of IFAC	3
- IFAC Symposium on Automatic Control in the Peaceful Uses of Space	5
- IFAC Symposium on Systems Engineering for Control System Design	8
- IFAC Symposium on the Theory of Self-Adaptive Control Systems	11
- IFAC/IFIP Symposium on Microminiaturization in Automatic Control Equipment and in Digital Computers	12
NEWS FROM NATIONAL MEMBERS	
- France	14
- Switzerland	14
- United Kingdom	14
- U.S.A.	14
Reports on past events	
- Austria	15
- Belgium	16
- Republic of South Africa	17
- Switzerland	18
- United Kingdom	18
- U.S.A.	19
Announcement of future events	
- Canada	23
- Czechoslovakia	23
- France	23
- Norway	26
- Switzerland	26
- United Kingdom	27
- U.S.A.	28
- USSR	28

WORLDWIDE AUTOMATIC CONTROL

PAGE

Reports on past international Conferences

- International Electronic Components Exhibition 29
- International Colloquium on Memory Techniques 29
- International Conference on Programming and Control 29

Announcements of future international Conferences

- International Exhibition of Industrial Electronics 30
- Third Australian Computer Conference 30

PUBLICATIONS

- Automation: Methodology and Research 31
- Proceedings of the Second Congress of IFAC 32
- Belgium 33
- France 34
- United Kingdom 34
- U.S.A. 34

IFAC NEWS

THIRD CONGRESS OF IFAC

We have already announced in Bulletins No. 16 (p. 18) and No. 18/19 (pp. 38 and 39) that the Third Congress of the International Federation of Automatic Control will be held in London, England, from 20th to 25th June, 1966. The organization of the Congress has been placed by IFAC in the hands of the United Kingdom Automation Council, with the co-operation of the Secretariat of IFAC and of its National Member Organizations.

It is proposed to group the papers in the following way:

Theoretical and General:

Discrete Systems, Stochastic Systems, Optimal Systems, Learning Systems, Reliability, Performance Criteria and Evaluation.

Applications:

Process Dynamics; Computer Applications, on or off line; Optimizing or Adaptive Control Applications.

Components:

Numerical Components, Fluid Amplifiers; Space Vehicle Actuators; New Solid-State Components and their use as Control Devices; Bionic Components; Component-Oriented Theory directed at broadening the application of existing components; Component Characteristics and Specifications and their Determination.

Management:

The Use of Control Theory and Computers in Management; Financial Effect of Introducing Computers or Automatic Control Equipment; Social Impact, such as Retraining or Relocation.

Some papers may also be accepted on traffic control and bio-engineering.

In addition, there will be expository lectures outlining significant developments in control theory, components and applications, designed to help participants to comprehend better the research results presented elsewhere at the Congress.

During the week following the Congress it is planned to arrange visits to places of historic and technical interest. Arrangements will be made for delegates and their wives wishing to do so, to stay from Sunday, 26th June, to Thursday, 30th June, in one of a number of centres from which visits will be made to industrial plants, laboratories and places of cultural interest. In each area it is hoped to arrange for a visit to a chemical works, a steel works and a nuclear power station.

F u r t h e r p a r t i c u l a r s m a y b e o b t a i n e d :

- e i t h e r , i n e a c h c o u n t r y , f r o m t h e c o r r e s p o n d i n g I F A C N a t i o n - a l M e m b e r O r g a n i z a t i o n ( s e e l i s t b e l o w )

- o r , i f n o n e , d i r e c t l y f r o m t h e H o n o r a r y S e c r e t a r y o f I F A C ,  
Dr.-Ing. G. Ruppel VDI,  
Postfach 10250,  
Düsseldorf 10, Germany.

**Member Organizations of IFAC**

- ARGENTINE Centro Argentino de Control Automatico, c/o H. R. Ciancaglini, Departamento de Electronica, Facultad de Ingenieria, Paseo Colon 850, Buenos Aires.
- AUSTRIA Osterreichisches Produktivitaets-Zentrum, Arbeitsausschuss für Automatisierung, Remgasse 5, Wien 1
- BELGIUM Institut Belge de Regulation et d'Automatisme, 3 rue Ravenstein, Bruxelles
- BULGARIA Bulgarian National Council of Automatic Control, 12 Narodno Sabranie, Sofia
- CANADA Associate Committee on Automatic Control, National Research Council, Ottawa 2
- CHINA Chinese Association of Automation, c/o Institute of Automation, Academia Sinica, Peking
- CZECHOSLOVAKIA Ustav Teorie Informace a Automatizace, Ceskoslovenska Akademie Ved, Vyssehradsk 4 49, Praha
- DENMARK Danish Automation Society, c/o Prof. Hylgaard-Jensen, Technical University, Lyngby
- FINLAND Finlands Regeringstekniska Salskap, c/o Electronics Division, Finnish Cable Works Co., P.O.B. 419, Helsinki
- FRANCE Association Francaise de Regulation et d'Automatisme, 19 rue Blanche, Paris 9e
- GREECE Technical Chamber of Greece, 4 rue Karageorgi Servias, Athens 125.
- HUNGARY Nemzetkozi Automatikai Szovetseg Magyar Nemzeti Bizottsaga, Magyar Tudomanyos Akademia, Nador utca 15, Budapest V
- INDIA The Institution of Engineers (India), 8 Gokhale Road, Calcutta 20
- ISRAEL Israel Committee for Automatic Control, P.O. Box 7063, Hakirya, Tel-Aviv
- ITALY Italian Committee on Automatic Control, c/o Sig. Mario Piscicelli, V. Ingrassia 33, Roma.
- JAPAN National Committee of Automatic Control, Science Council of Japan, Ueno Park, Tokyo
- NETHERLANDS Koninklijk Instituut van Ingenieurs, Sectie voor Regeltchniek, c/o Technische Hogeschool, Lab. voor Technische Natuurkunde, Lorentzweg 1, Delft
- NORWAY Norsk Forening for Automatisering, Kronprinsensgate 17, Oslo
- POLAND Polski Komitet Pomiarow i Automatyki, Naczelna Organizacja Techniczna w Polsce, ul. Czackiego 3/5, Warszawa
- ROMANIA Comisia de Automatizare, Academia Republicii Populare Romine, Calea Victoriei 125, Bucuresti
- REPUBLIC OF SOUTH AFRICA South African Council for Automation and Computation, Secretary, P.O. Box 395, Pretoria
- SWEDEN Svenska Kommiten for IFAC, c/o Ingenjorsvetenskapsakademien, Box 5073, Stockholm 5
- SWITZERLAND Schweizerische Gesellschaft für Automatik, Secretary: Dr. A. von Schulthes, Wasserwerkstrasse 53, Zurich
- TURKEY Turk Otomatik Kontrol Kurumu, Istanbul Teknik Universitesi, Istanbul
- UNITED ARAB REPUBLIC The General Organisation for Industrialization, Industrial Design Administration, 4 Moudretiat El Taher St., Garden City, Cairo
- UNITED KINGDOM United Kingdom Automation Council, c/o Institution of Electrical Engineers, Savoy Place, London, W.C.2
- UNITED STATES OF AMERICA American Automatic Control Council, c/o Dr. G. Weiss, Electrical Engineering Department, Brooklyn Polytechnic Institute, 333 Jay Street, Brooklyn 1, N.Y.
- UNION OF SOCIALIST SOVIET REPUBLICS Nationalny Komitet USSR po Avtomaticheskomu Upravleniu, Kalindchevskaja ul. 15a, Moscow I-53
- YUGOSLAVIA Jugoslovenski Komitet za Elektroniku, Telekomunikacije, Automatizaciju i Nuklearnu Tehniku, P.O.B. 356, Beograd

**IFAC SYMPOSIUM**

**ON AUTOMATIC CONTROL IN THE PEACEFUL USES OF SPACE**

S t a v a n g e r , N o r w a y ,  
21st to 24th June, 1965

**PRELIMINARY PROGRAMME**

**a) Injection into space.**

- 2) Guidance of vehicles for correct trajectory.  
Mathieu, J. P. (Belgium) «A Hamiltonian Approach to an Optimal Guidance Law of a Space Vehicle».
- Meyers, G. H. (USA) «Experience with the Applications of Radio Command Guidance to Satellite Launch Vehicles».

**b) Attitude stabilization.**

- 1) Passive methods of satellite and exploratory vehicle stabilization.  
Kershner, R. B., Fischell, R. E. (USA) «Gravity Gradient Stabilization of Earth Satellites».
- Tinling, B. E., Merrick, V. K. (USA) «The Status of Passive-Gravity-Gradient Stabilization».
- 2) Methods based on expenditure of fuel.  
Nishikawa, Yoshikazu (Japan) «Time, Fuel and Energy Minimization in Three Dimensional Attitude Control of Orbiting Satellites».
- 3) Methods based on gyroscopic phenomena.  
Fischell, R. E. (USA) «Spin Control for Earth Satellites».
- 4) Methods based on magnetic phenomena.  
Mesch, F., Schweizer, G. (Germany) «Investigation of Attitude Controlled Satellites with Magnetic Phenomena».
- c) Remote control of space vehicles.
  - 1) Correction of orbits at great distances.  
Claus, A. J. (USA) «On Systematic Errors in Trajectory Determination Problems».
  - Stern, R. G., Potter, J. E. (USA) «Optimization of Midcourse Velocity Corrections».

- 3) Reentry control techniques.  
Wingrove, R. C. (USA) «Guidance and Control in Supercircular Atmosphere Entry».

**d) Problems of manned systems.**

- 1) Characteristics of man as part of a vehicle control loop.  
Gunderson, R. W., Hardy, G. W. (USA) «Piloted Guidance and Control of the Saturn V Launch Vehicle».
- 2) Optimum use of man in control of space vehicles, in orbit and during reentry.  
Bernotat, R. (Germany) «Prediction Display, a Way of Easing Man's Job in Integrating Control Systems».

**e) Ground systems.**

- 2) System for control of ground antennas.  
Lund, C. O. (Denmark) «On Systems Aspects of Low-Cost Ground Stations for Satellite Communications».  
Lundh, Y. (Norway) «Special Computer for Simplified High Performance Ground Antenna Steering».

**f) Reports of control of specific systems.**

- 1) Unmanned systems for explorations.  
Chang, R. K. (USA) «Surveyor Terminal Guidance».  
Jenkins, L. E. (USA) «The Agena Attitude Stabilization System — A Case Against Optimization».  
Scull, J. R. (USA) «Guidance and Control of the Mariner Planetary Spacecraft».
- 2) Manned systems.  
Chilton, R. G. (USA) «Apollo Spacecraft Control Systems».  
Trageser, M. B., Hoag, D. G. (USA) «Apollo Spacecraft Guidance System».
- 3) Communication system.  
Williams, D. D. (USA) «Control of the Syncom Communication Satellite».
- 4) Weather observation systems.  
Manger, W. P. (USA) «Attitude Control for the TIROS Weather Satellites».
- 5) Other systems.  
Blackburn, E. P. (USA) «The Orbiting Geophysical Observatory Attitude Control System».  
Shenton, D. B., Black, W. S. (UK) «Fine Solar Alignment System for Operation in Stabilized Vehicles».

**g) Advanced components for space vehicle and instrumentation control problems.**

- 1) Inertial, stellar and terrestrial navigation sensors.  
Ashtmeier, R. W. (USA) «Infrared Horizon Sensors for Attitude Determination».
- 2) Power control elements.  
Strait, B. G. (USA) «Automatic Startup for Nuclear Reactor Rocket Engines».
- 3) Signal processing components.  
Lagasse, J. (France) «Low Power Signal Transformation for Space Applications».
- 5) Optical components.  
Estey, R. S. (USA) «Tracking the Partially Illuminated Earth or Moon».

**h) Digital and analog computers as used in automatic control systems in space vehicles or ground stations.**

- 1) Computer systems.  
Ergott, H. L. (USA) «Design Considerations for Space Vehicle Control Computers».
- 3) Programming of computers.  
King, C. F. (USA) «Computer Programming for Control of Space Vehicles».  
Lawton, T. J., Muntz, C. A. (USA) «Organization of Computation and Control in the Apollo Guidance Computer».

**i) Future control problems.**

- 2) Requirements for control components for space vehicle control.  
Gould, C. H. (USA) «Control and Guidance Research at NASA».

In addition there will be approximately 15 papers from USSR.

Further particulars may be obtained from:

Mr. Lars Mourad-Krohn,  
IFAC Symposium,  
P.O. Box 66,  
Kjeller, Norway.

IFAC SYMPOSIUM  
ON SYSTEMS ENGINEERING FOR CONTROL SYSTEM DESIGN

Tokyo, 25th to 28th August, 1965

The Symposium has already been announced in Bulletin No.18/19 (pp. 36 and 37).

The list of papers to be presented is as follows:

- Session I: System Design
- I-1 "Minimum Energy Time-Optimal Control for Saturating-Data Systems" by J.C. Hung and A.M. Revlin (USA)
- I-2 "Automatic Design of Automatic Control Systems with the Help of Digital Computer" by R. Tagawa (Japan)
- I-3 "Solution of Non-linear Problems with the Root Locus Method" by J. Ben Uri (Israel)
- I-4 "Application of the Linear-Programming Technique to the Numerical Solution of Optimal Control Problem" by Y. Sakawa and C. Hayashi (Japan)
- I-5 "The Practical Application of Optimisation Theory to System Design" by J.F. Coates (UK)
- Session II: Stochastic Systems
- II-1 "On Optimal Filtering and Control in Stochastic Control Systems" by A.Z. Meiri (Israel)
- II-2 "Learning and Optimizing Control by a Statistical Model" by T. Suzuki and B. Kondo (Japan)
- II-3 "Optimal Bayesian and Min-max Controls of a Class of Stochastic and Adaptive Dynamic System" by M. Aoki (USA)
- Session III: Optimum Controls
- III-1 "General Theory of Optimal Processes" by Sheldon S.L. Chan (Japan)
- III-2 "Optimizing Control of Large-Scale System Using Modified Decomposition Principle" by K. Funakura and O. Yoshida (Japan)
- III-3 "Some Computational Aspects of Dynamic Programming in High Dimensions" by A.E. Durrin (USA)
- III-4 "Computation of Time-Optimal Control Inputs for Linear Systems" by I. McCausland (Canada)
- III-5 "A Practical Approach to Control System Optimization" by R.E. Bach, Jr. (USA)
- Session IV: Learning Systems
- IV-1 "System Identification by Bayesian Learning" by T. Funakura (Japan)
- IV-2 "Problem of Learning Machines and Large Scale Systems Control" by A.Ya. Lerner, V.N. Vapnik and A.Ya. Chervonkis (USSR)

- IV-3 "Learning Control Systems (Learnrol I-V)" by M. Oda and K. Nakamura (Japan)
- IV-4 "Learning Systems" by J.F. Tou (USA)
- Session V: Simulation
- V-1 "Identification of the System Parameters and Development of the Mathematical Model of a Process Control System by Means of the Measured Step Response" by H. Unbehauen (Germany)
- V-2 "Computer Simulation of Pattern Recognition by using Cell Assemblies and Contour Projection" by T. Kasvan (Canada)
- V-3 "Characterization and Evaluation of Hybrid (Analog-Digital) Systems" by W.J. Karplus and J. Vidale (USA)
- V-4 "Optimization of a Sulphur Recovery Process" by R. Rönnefeldt, M. Carmassi and J. Helin (Switzerland)
- Session VI: Identification Procedures
- VI-1 "Simultaneous Identification of Multi-Input and -Output Systems" by K. Izawa and K. Furuta (Japan)
- VI-2 "Identification in Adaptive Control Processes: A Computational Method" by K.S.F. Kumar (USA)
- VI-3 "An Identification Method of System Characteristics Using a New Type of Adaptive Correlating Filter" by K. Tanaka, S. Higuchi and S. Maekawa (Japan)
- VI-4 "Identifier for an Unknown Process" by O.J.M. Smith (USA)
- VI-5 "General Method for the Analysis of Complicated Process Characteristics" by Y. Umetsu (Japan)
- Session VII: Utilities
- VII-1 "Application of Statistical Method for the Analysis of Electric Power Systems" by S.D. Gupta (India)
- VII-2 "Application of the Theory of Control Systems to French Steam Power Plants" by R.R. Chausserd (France)
- VII-3 "Control of a Nuclear Boiler by Dynamic Optimisation" by P.K. Pherson and G.B. Collins (UK)
- VII-4 "Analytical Study of Conveyor System Control" by M. Kawahata (Japan)
- VII-5 "One Unloader Automation - A Feasibility Study" by C.F. Aisop, G.A. Foster and F.R. Holmes (UK)

- Session VIII: T r a n s p o r t a t i o n
- VIII-1 "An Approach to Optimization Problem in Train Operation" by N. Inada (Japan)
- VIII-2 "Train Operation System" by S. Yamazaki (Japan)
- VIII-3 "Stability and Controllability of Vehicles for High Speed and High Traffic Permeability" by I. T. Li (Japan)
- VIII-4 "Control System for Automatic Automobile Driving" by Y. Oshima, E. Kikuchi, M. Kimura and S. Matsumoto (Japan)
- Session IX: M u l t i - v a r i a b l e a n d M u l t i - l e v e l S y s t e m
- IX-1 "Eigenvalue Trajectories in Multivariable System Design" by J. Mann and S.A. Marshall (UK)
- IX-2 "An Automatic Way of Finding 'Optimal' Control Systems for Large Multivariable Linear Plants" by E.J. Davison (Canada)
- IX-3 "Self-Adjusting Models of Multivariable Systems" by H.A. Barker (UK)
- IX-4 "Advances in Multi-level Control" by J.D. Pearson, M.D. Mesarovic, I. Lefkowitz, J. Lasdon, C.B. Brosilow and B. Durbek (USA)
- IX-5 "On the Structure Synthesis Problem in Multi-level Control Systems" by A. Staszak (Poland)
- Session X: I d e n t i f i c a t i o n o f S y s t e m s
- X-1 "Procedures for Process Identification and Control System Design Applicable to Chemical Processing Systems" by J.C. Hoenen (USA)
- X-2 "Fundamental Approach to the Identification and Optimization of Chemical Reaction Processes" by Y. Sawara, Ei, T. Nakamura, H. Fukawa and H. Sawayama (Japan)
- X-3 "Identification of Some Static and Kinematic Characteristics of a Space Vehicle by On-Board Inertial Measurements" by R.E. Robertson (USA)
- X-4 "Particularities of Mathematical Description of Economical Control Processes" by V.A. Volkonsky (USSR)
- Session XI: S y s t e m s i n G e n e r a l
- XI-1 "The Analysis and Synthesis of Complex Control Systems with Variable Criterion Functions" by O.T. Leonardes and J.A. Payne (USA)

- XI-2 "Extremum Control in Engineering and Management" by N. Hamza (Switzerland)
- XI-3 "Design and Control of Multiport Engineering Systems" by H.M. Payne and D.C. Karnopp (USA)
- XI-4 "On Design Theory of Large Scale Discrete Systems" by H.J. Ehling (Germany)
- XI-5 "Regulation and Control in Biological Systems" by S.Z. Cardon and A.S. Iberall (USA)

The above list is subject to change.

The final programme of the Symposium will be handed to the members at the Registration Desk in the Symposium Office, Kokuritsu Kyokai Kaikan (National Education Center), Tokyo.

**Expository Lectures**

"System Engineering Challenges and Opportunities for Automatic Control" by H. Chestnut (USA)

One or two more expository lectures will be delivered at the Symposium.

Registrants will be handed to all the members, free of charge, at the Registration Desk in the Symposium Office at the National Education Center. The Programs will be published in spring 1966.

Registration fee will be 5,000 Yen (approximately 14 U.S. Dollars).

Technical visits and tours will take place after the Symposium.

All enquiries concerning the Symposium should be addressed to:

IFAC Tokyo Symposium Committee  
 Tokyo Central P.O. Box 1057  
 Tokyo, Japan.

IFAC SYMPOSIUM

ON THE THEORY OF SELF-ADAPTIVE CONTROL SYSTEMS

Teddington, U.K.  
 14th to 17th September, 1965

As already announced in Bulletin No. 18/19, an international Symposium on the Theory of Self-Adaptive Control Systems will be held at the National Physical Laboratory, Teddington, U.K., from 14th to 17th September, 1965. The Symposium, which will be organized by the Society of Instrument Technology, will be held under the auspices of the International Federation of Automatic Control. The programme has been selected from a wide offering of papers received from many countries, and forms a useful summary of the state of the art at this time. The papers have been selected as far as possible, to give a world picture of progress in the specialist subject of the Symposium.

Due to restriction on the accommodation available, the number of participants will be limited to about 140. The registration fee is £70 or \$28. Registration enquiries should be addressed to:

IFAC Teddington Symposium 1965,  
c/o The Secretary, S.I.T.,  
20 Peel Street, London, W.8, England.

About 28 papers will be presented, classified under the following headings:-

- Controllers using Stochastic Decision Processes
- Adaptive Control in Biological Systems
- System Identification
- Adaptive Controllers using Deterministic Models
- Control using Perturbation Techniques

Delegates will have the opportunity of touring the National Physical Laboratory and the Imperial College of Science and Technology.

Enquiries regarding this Symposium, however, should be addressed to the Society of Instrument Technology (S.I.T.) at the above address.

IFAC/IFIP SYMPOSIUM ON MICROMINIATURIZATION  
IN AUTOMATIC CONTROL EQUIPMENT AND IN DIGITAL COMPUTERS

M u n i c h , Germany  
21st to 23rd October 1965

This Symposium is being organized by VDI/VDE-Fachgruppe Regelungstechnik with the co-operation of NTG-Nachrichtentechnische Gesellschaft im VDE and sponsored by IFAC International Federation of Automatic Control and IFIP International Federation of Information Processing. The Symposium has been proposed by the IFAC Technical Committee on Components at its meeting in Stockholm, September 1964.

The topics on which papers may be offered are as follows:

1. New pneumatic and hydraulic components
2. Optical components
  - Electro-optical components
  - Electroluminescence
  - Miniature optics
3. Storage components
  - Ferrite storage
  - Magnetic film storage
  - Ferroelectrical storage
  - Cryogenic storage
4. Integrated circuits in planar, thin film and hybrid techniques with
  - Injection transistors
  - Field effect transistors
  - Polycrystalline semiconductors

5. Construction and interconnection techniques of miniaturized components

6. Microminiature measuring devices and transducers for mechanical, acoustical, optical, magnetic, electrical and thermal variables as well as for the determination of radioactivity and composition of substances

7. Trends and limits of microminiaturization  
Expansion of the application field through higher reliability and speed, smaller volume, simplified construction of extensive systems, and more favorable physical characteristics

It is intended to provide papers in advance of the meeting. At the Symposium the authors will be asked to summarize their paper as an introduction to an extensive discussion.

If a particularly great number of papers are offered for one specific subject, General Reports will be presented in order to gain time for discussion.

In the preprints the reports will be printed in one of the official languages (English, French, German, Russian). Interpreters will be available at the Symposium for consecutive translation into the English language.

Officers of papers together with an abstract (10 lines) should be received by the Secretary not later than 10 April 1965. The authors are requested to send the manuscript of the full paper by 10 July 1965 in order to ensure prompt delivery of preprints to the attendants of the Symposium.

All relevant corespondance should be addressed to

Gerd Müller  
Secretary IFAC/IFIP Symposium  
P.O. Box 834  
Karlsruhe, Germany.

Attendance at the Symposium will be by registration only. Application forms should be asked from:

Verein Deutscher Ingenieure - Abt. O  
P.O. Box 10250  
Duesseldorf 10, Germany.



### NEWS FROM NATIONAL MEMBERS

#### France

The AFRA (Association Française de Régulation et d'Automatisme - French Association of Automatic Control) has elected, in the course of its General Assembly held on 14th December 1964 the following OFFICERS:

- President: Mr. Marcel Mamy
- 1st Vice-President: Mr. Uffler
- (in charge of national problems)
- 2nd Vice-President: Mr. Féron
- (in charge of relationship with IFAC)
- Treasurer: Mr. Kremlansky
- Honorary Secretary: Mr. Cseh
- Assistant Honorary Secretary: Mr. Peyraud
- Delegate: Mr. Gruart

#### Switzerland

The ASSPA (Association Suisse pour l'Automatique - Swiss Association for Automatic Control) has elected, in the course of its General Assembly, the following OFFICERS:

- President: Prof. Dr. Paul Pfoser, Eidgenössische Technische Hochschule Zürich
- Vice-President: Dipl. Ing. Adrien Kessler, c/o Elektro-Watt A.G., Zürich
- Honorary Secretary: Dr. Michel Cudod, c/o Société Générale pour l'Industrie, Genève
- Executive Secretary: Dr. Anton von Schultness, Zürich
- Treasurer: Werner Birchler, c/o Chr. Feller A.G., Bümpliz (BB)

All correspondence should be addressed to the Executive Secretary, Dr. Anton von Schultness, Wasserwerkstrasse 55, Zürich.

#### United Kingdom

The Institution of Electronic and Radio Engineers has awarded the J. Langham Thompson Premium for the outstanding paper in the field of control engineering to Mr. G.B. Cole and Mr. S.L.H. Clarke for their joint paper "The Development of ARCH - A Hybrid Analogue-Digital System for Computers for Industrial Control".

#### USA

The ASME 1964 Machine Design Award has been awarded to Prof. Rufus Oldenburger, Director of the Automatic Control Center at Purdue University, Lafayette, Indiana.

### Reports on past events

#### Austria

The ÖAA (Österreichischer Arbeitsschutz für Automatisierung - Austrian Working Committee for Automation) has organized in 1964 and in the beginning of 1965 the following events:

- 1964
- 14-16 Jan. Experimental lectures on microswitches
- 21, 23 Jan. "Safeties and safety controls" by F. Metzger
- 23, 24 Jan. Lectures on Automatic Control by K. Liechtblau, Vienna
- 3 Feb. Seminar "Does the acquisition of a punched-card device pay-off?" conducted by R. Steiner, Vienna
- 11-14 Feb. Experimental lectures on open-loop control (fundamentals and control circuits)
- 25, 27 Feb. Lectures on Electronics by E. Tautner, Vienna
- 11, 13 Mar. Seminar on Automation in Wood Processing
- and 1 Apr. Experimental lectures on Oscillography
- 1-3 Apr. "Digital techniques - a fundamental feature of automation" by F. Fritzsche, Graz
- 16 Apr. Lectures on pneumatic binary elements
- 24, 29 June Analog computing techniques and control processes and I, 6 Oct. by H. Müller
- 13-16 Oct. Experimental lectures on open-loop control: "The pulse storage of the LOGISIM system and its use for digital circuits and registers" by K. Steidl and G. Stenzl, Vienna;
- 29 sept. "Synthesis of the binary step and its cooperation with other components of the SIMATIC system" by K. Winter, Vienna;
- 13-16 Oct. "Properties of the digital MINIWATT (VALVO) system in pulse circuits" by A. Halkiewicz, Vienna
- 17, 19, 24, 25 Lectures on Remote Control by G. Swoboda
- November
- 25 Nov. Seminar on welding and flame-cutting automation: "Automation in welding techniques, basic considerations with examples" by O. Gengenbach, Sindelfingen, Germany;
- "Automation through electroslag welding processes" by B. Kjellberg, Göteborg, Sweden;
- "Welding automata in shipbuilding, tank manufacturing and piping erection" by L. Wolff, Hohlriegelskreuth, Germany;

**Belgium**

- The I.B.R.A. (Institut Belge de Régulation et d'Automatisme - Belgian Institute of Automatic Control) organized in 1965 the following lectures on the USE OF SPECIAL-PURPOSE COMPUTERS IN INDUSTRIAL CONTROL:
- 15 Feb. Introduction by Charles and Peretz
- 22 Feb. "The automatic control of an electric point-welding machine" by G. Mansart
- 1 Mar. "Problems of parametric process identification" by Debelle and Fourneau
- 8 Mar. "Methods of logic system analysis and synthesis" by J. Florine
- 15 Mar. "Automation of blast furnace loading by means of a static logic equipment" by Faquet
- 22 Mar. "Parametric control of industrial processes" by R. Vasquez
- 29 Mar. "Problems involved by discontinuous automatic control" by J.-P. Waha
- 5 Apr. "Automatic control of a gas mixture by means of an embodied analog computer" by M. Waucquez
- 12 Apr. "Automation of an ore-sintering plant by means of a digital computer" by C. Hubaut and M. Veyts.

"Semi-automatic and automatic electric welding in practical use" by R. Marek, Vienna;  
 "Modern flame-cutting machines, their influence on economical manufacturing and their progressive automation" by H. Hirschberg, Frankfurt, Germany;  
 "Special types of flame-cutting machines for obtaining economical manufacturing" by R. Strauss, Frankfurt, Germany;  
 Film display "Automation in pictures"

3 Dec. 1965  
 14 Jan. "Principles and devices of industrial data processing" by E. Lautner and H. Roither, Vienna  
 26, 28 Jan. Lectures on electric measurement of non-electric magnitudes by W. Kudrna  
 17 Feb. Seminar on programmed teaching:  
 "Teaching according to programmes - the idea and the efficiency of programmed teaching" by Joh. Zielinski, Aachen, Germany;  
 "Possibilities and limitations of programmed teaching in general-education schools" by H.J. Gollinski, Würzburg, Germany;  
 "Problems of Practical programme elaboration" by E. Gemacher, Vienna;  
 "The programmed teaching in the industrial development" by R.W. Schirm, Frankfurt, Germany.

**Republic of South Africa**

- The SACAC (South-African Council for Automation and Computation) organized on 24th to 27th September, 1963 its first SYMPOSIUM ON AUTOMATION AND COMPUTATION
- in Johannesburg (see Bulletin No. 16, p. 29) where the following papers were read and discussed:
- "Society, feedback and automation" by J. Zawels
- "Calculation of induction motor performance with the use of a digital computer" by A.S. Meyer
- "An electronic weight controller for heavy industry" by N.S. Woolf
- "The supervisory and security system at the South-African Broadcasting Company remote frequency-modulation transmitting stations" by W.A.T. Jackson
- "A recording two-colour optical pyrometer" by J.P. Gous
- "Significance arithmetic - a comparison of alternative methods" by D.S. Henderson
- "An electronic analogue computer for the solution of non-linear partial differential equations encountered in the study of self-heating of fishmeal" by L.L. van Zyl
- "Network analysis techniques for project planning and control" by N.F. Lawrence
- "Die gebruik van Rekenoutomate by die Ontwerp en Aanbou van Paale" by G. de V. de Kock
- "Method for estimating the location of the zeros of polynomials" by J.H.J. Filster
- "Active two-port properties using Smith chart" by J. Zawels
- "The role of applied mathematics in the age of automation" by R. Braae
- "Self-adaptive control systems" by O. Rubin
- "A study of the measurement and control of the blast furnace process" by D.C. Farguharson and P.F. Roos
- "Analogmodel vir Studie van die Tydöonstantes van 'n Hoog-öond" by P.F. Roos and D.C. Farguharson
- "Use of a computer for clerical procedures in the Rand Mines Group" by P.C. Pirow
- "Digital computers open up new avenues of hydrological research" by B.M. Reich
- "A design study of a gas flow control system" by J.B. Blignaut and G. Brown
- "Struktuur - Analise met 'n Syferrekenaar" by A.B. Hugo
- "Loop-position sensing devices" by J. Zawels and F.V. Ashpole

- "Components - Desired performance for successful automation" by O. Brune
- These 21 papers with their discussions are now published in a 380 page Volume.

**Switzerland**

**ACTIVITIES OF THE GENEVA SECTION OF ASSPA IN 1964-1965**

- 12 lectures (every fortnight) on optimal methods and models in econometry by L. Solari
- 2 lectures on mathematics of optimization in automatic control by L. Pun
- A seminar on Pert methods and their application to the optimization of production and to the minimization of costs by A. Kaufmann.

**ACTIVITIES OF THE JURA SECTION OF ASSPA IN 1964-1965**

- in Biemme, lectures on:
  - Pneumatics and hydraulics
  - Measuring techniques
  - Digital Controls (continuation)
  - Probabilities and mathematical statistics
  - Programming (one session)
- in La Chaux-de-Fonds and Locle, lectures on:
  - Hydraulic controls by M. Chevalier
  - Boolean algebra by J. Bielser.

**United Kingdom**

**CONFERENCE ON RECENT ADVANCES IN AUTOMATIC CONTROL**

A Conference on Recent Advances in Automatic Control takes place in Nottingham University from 5th to 9th April, 1965. The Conference is organized by the Institutions of Mechanical Engineers, Electrical Engineers, Chemical Engineers, Electronic and Radio Engineers, and Production Engineers; the Royal Aeronautical Society, and the Society of Instrument Technologists, under the aegis of the UKAC. The administration work of the Conference is in the hands of the Institution of Mechanical Engineers, 1 Birdcage Walk, London, S.W.1.

The Conference includes papers under the following headings:- Process applications of computers; Random Processes in Control Systems; Automatic Control in the Steel and the Electricity Generating Industries; Automatic Control of Machine Tools; Automatic Control in Aircraft; Mathematical Methods in Systems Engineering; Self-Adaptive and Optimal Control Systems; Components and Fail-Safe Systems; Automatic Control in Coal Mining; Applications of Control in the Process Industries.

**SYMPOSIUM ON DIRECT DIGITAL CONTROL**

The Society of Instrument Technology organises a Symposium on Direct Digital Control on 22nd April, 1965, at 10 a.m., Northampton College of Advanced Technology, St. John Street, London, E.C.1. Registration is required.

**USA**

**1964 SYSTEMS SCIENCE CONFERENCE**

This Conference was held at the University of Pennsylvania, Philadelphia, on 15th and 16th October, 1964, under the aegis of the Institute of Electrical and Electronics Engineers with the following programme:

- S y s t e m s T h e o r y**
  - "Definitions of Systems Engineering Terms" by H. Levenstein
  - "Systems Engineering from an Engineering Viewpoint" by A.D. Hall
  - "Systems Engineering Theory from an Operations Research Viewpoint" by R. Ackoff and S.S. Sengupta
- S y s t e m s O p t i m i z a t i o n**
  - "Review of Design Optimization Techniques" by C.F. Wood
  - "Application of Dynamic Programming to Routing Problems" by K.A. Regley and R. Jefferis
- S y s t e m s S c i e n c e E d u c a t i o n**
  - "A Survey of Systems Science Education" by W.G. Bender
- S y s t e m s R e l i a b i l i t y**
  - "Simplified Reliability Calculations for Complicated Systems" by J.A. Lechner
  - "Systems Reliability and Effectiveness" by I. Bazovsky
  - "Synergomorphic Analysis of Systems Reliability" by J.C. O'Brien
- S y s t e m s M o d e l i n g**
  - "Bayesian Decision Models for Systems Engineering" by R.A. Howard
  - "Mathematical Model of Socio-Economic Systems. An Example" by H.E. Koenig
  - "Modeling as Applied to the Evaluation of Alternative Systems" by J. Reitman, R.F. Kelly, R.M. Malmgren, N. Miller
  - "Optimum Teaching Procedures derived from Mathematical Learning Models" by J.E. Matheson.

- "Identification of Linear Dynamic Systems" by Y.C. Ho and R.C.K. Lee
- "A Theory of Adaptive Compression" by I.D. Davidson.

1964 NORTH-EAST ELECTRONIC RESEARCH ENGINEERING MEETING

This meeting was held in Boston on 4th to 6th November, 1964 under the aegis of the Boston Section of the Institute of Electrical and Electronics Engineers. Amongst the many papers read, the following (Given with short abstracts) are of interest to control engineers:

- "A Corrected-Conventional Describing Function for Intermediate-Order Nonlinear Control Systems" by R.R. Rankine, Jr. and J.J. D'Azzo:

The corrected-conventional describing function uses the r.m.s. value of the fundamental and third harmonic in the output of a nonlinearity. Many predicted amplitudes of self-sustained oscillations in feedback control systems are more accurate than with other describing functions.

- "On the Partial Differential Equation for the Conditional Probability Distribution for Non-linear Dynamic Systems with Noisy Measurements" by R.L. Kashyap, Harvard University, Cambridge, Mass.

The partial differential equation has been derived for the conditional probability density distribution of the output of a stochastic nonlinear system with nonlinear noisy measurements. For linear systems, the Wiener-Kalman filter can be derived from the above equation.

- "Fuel Optimal Control of Second-Order Linear Systems with Bounded Response Time" by D.L. Kleinman and M. Athans, Department of Electrical Engineering, MIT, Cambridge, Mass.

Fuel-Optimal control of linear, second-order, real pole systems is investigated with response time constraints. The control that minimizes a linear combination of time and fuel is determined for (1) a double integral and (2) an integral plus time-constant plant.

- "Synchronization of Phase-Locked Loops" by T.S. Baker, Yale University, New Haven, Connecticut

Phase-locked loops are used to track varying frequency inputs and to modulate or demodulate carrier signals, but almost every application requires the synchronization of the loop to a periodic input. An approximation technique is developed in this paper that predicts the ranges of parameters for which the phase-locked loop synchronizes to a sinusoidal input of constant frequency.

**Announcement of future events**

**Canada**

CANADIAN ELECTRONICS CONFERENCE AND EXPOSITION

This Conference will be held in Toronto from 5th to 8th October, 1965. Inquiries should be addressed to:

Grant Smedmore,  
1819 Yonge Street,  
Toronto, Ontario, Canada.

**Czechoslovakia**

CONFERENCE ON

APPLICATIONS OF MATHEMATICAL STATISTICS IN ENGINEERING

This Conference will be held in Prague from 31st May to 4th June, 1965. Inquiries should be addressed to:

Czechoslovak Scientific and Technical Society,  
Praha 1, Siroka 5, Czechoslovakia.

**France**

CONGRESS OF AUTOMATIC CONTROL THEORY

This Congress will be held from 4th to 7th May, 1965, at the National Institute of Nuclear Science and Techniques in Saclay, near Paris.

The following items will be more particularly considered in the fields of linear or nonlinear, determined or stochastic, continuous or sampled-data systems:

- (a) IDENTIFICATION of processes in view of their automatic control: static and dynamic mathematical models, a priori or evolutionary models, adaptive models.
- (b) OPTIMIZATION of automatic controls: choice of the optimality criterion (cost function), variational methods, dynamic programming (Bellman), maximum principle (Pontryagin), optimal switching, direct methods, adaptive and self-optimizing systems, self-learning systems.
- (c) STABILITY of automatic systems: Liapunov's and Letov's methods and their extensions.

The morning sessions of 4th, 5th and 6th May will be devoted to lectures, the afternoon sessions and those of 7th May will be devoted to discussion papers (preprints of which will be available beforehand). These are the following:

LECTURES:

- "Geometry of optimal processes" (2 lectures) by Prof. G. Letman, University of Berkeley, Calif., U.S.A.
- "On an extension of Pontryagin's principle" by Prof. Paulu de la Barrière, University of Caen, France

- "Degenerate instances in optimal process geometry" by Prof. A. Blaquiere, Paris University
- "Process identification methods" by J. Loeb
- "Optimization by means of automatic computers" (author yet unknown).

DISCUSSION PAPERS:

- "Identification of a process to a second-order mathematical model" by J. Debelie, Brussels, Belgium
  - "Identification by automatic control of an analog model" by P. Eykhoff, Delft, Netherlands
  - "On the general problem of optimization" by A. Bastiani, Caen, France
  - "Generalization of Noether's theorem to an optimized control process" by A. Bermond, Caen, France
  - "Prediction and filtering in the instance of Generalized random processes in the sense of K Ito" by B. van Cutsem, Caen, France
  - "On some optimal control problems in the instance where the control domain is not convex" by Castaing, Caen, France
  - "State evaluation in stationary dynamic programming" by Valadier, Caen, France
  - "On the stability and response time of systems described by finite-difference equations" by Y. Sevely and P. Vidal, Toulouse, France
  - "The use of polynomial filters" by Boudarel, Paris
  - "Investigation of sampled-data systems in the instance where samples are lacking" by Guichet, Paris
  - "Sensitivity investigation in optimization problems" by Delmas, Paris
  - "Optimal operation of coupled power stations" by A. Baudras-Chardigny, Paris.
- REGISTRATION for this Congress should take place before 15th April by sending to:
- Association Française de Régulation et d'Automatisme, 19, rue Blanche, Paris 9e - Phone: 874-66-36
- the registration fee of 50 French francs (25 Fr.frs. for authors), including preprints of discussion papers, and by indicating whether the participant intends to attend:
- the banquet in the evening of 7th May (40 Fr.frs.)
  - the visit of the Saclay Nuclear Centre in the morning of 8th May.
- Cars will bring participants from Paris to Saclay throughout the duration of the Congress (transportation cost for the whole duration: 25 Fr.frs.).

SYMPOSIUM ON AUTOMATIC CONTROL IN NUCLEAR RESEARCH AND INDUSTRY

This Symposium will be held in Grenoble on 29th and 30th September and 1st October, 1965.

The first two days and the morning of the 1st October will be devoted to the presentation of papers, preprints of which will be available. The afternoon of the 1st October will be devoted to technical visits in Grenoble and its suburbs, whilst on 2nd and 3rd October other visits will be provided to the Mont-Cenis power station dam and to the supersonic blowdown tunnel in Modane, both located in the Alps.

During the 2 1/2 days' sessions, the following papers will be read and discussed:

- "Improvement of low-level measurements for the input to a computer" by Mr. Tournier, Nuclear Studies Centre of Grenoble
- "Dynamic investigation of thermal sensors by an optical method" by Mr. Wagner, Polytechnic Institute of Grenoble
- "On an automatic method of complex ray spectra analysis" by Messrs. Chery, Escudie and Morgue, University of Lyons
- "Use of digital computer for starting and controlling the Electricité de France no. 5 nuclear power station" by Mr. Morin, Electricité de France
- "Processing of set-points of the analog control by means of a digital computer at Saint-Laurent-des-Baux" by Mr. Benmergul, Electricité de France
- "Prospects of Automatic Control development in nuclear Power stations" by Mr. Pupponi, Electricité de France
- "Radiometric measurements around nuclear power stations" by Messrs. Dieval, Boverard, Doury and Monet, Atomic Energy Commission
- "Plan of centralized processing of radiation-safety means" by Messrs. Amardell, Boudelle and Vacarte, Nuclear Studies Centre of Grenoble
- "Application of statistical tests for checking some nuclear counting sets" by Mr. Friedling, Nuclear Studies Centre of Cadarache
- "Simulation of the RAPSDIE reactor by means of analog computers" by Mr. Charretton, Nuclear Studies Centre of Cadarache
- "Design and test of the control of a heat exchanger" by Mr. Antoine, Electricité de France
- "The multiple control" by Prof. Perret, University of Grenoble, and Messrs. Garrud and Giraud, Nuclear Studies Centre of Grenoble
- "The automatic control of a cyclotron" by Mr. Ferné, University of Grenoble

- "The automatic control, by the particle beam, of the accelerator system of the SATURNE cyclotron" by Mr. Gabet, Nuclear Studies Centre of Saclay
  - "Problems of automatic control of a linear electron accelerator" by Mr. Rojand, Nuclear Studies Centre of Saclay
- For registration and inquiries, apply to:

Association Française de Régulation et d'Automatisme  
19, rue Blanche, Paris 9e - Phone: 874-66-36

## Norway

### AUTOMATICA 65

Automatica 65 is the fourth of a series of specialized exhibitions with affiliated study conferences in the field of instrumentation, control and automation, organized by the Norwegian Industries Development Association. The exhibition will take place from 3rd to 10th November, 1965 in Oslo. Exhibits will include Instruments, Apparatus and Equipment for Measuring and Process Control in the chemical industry; Instruments, Apparatus and Equipment for Measuring and Control in the engineering industries; Optical Equipment; Equipment for Mechanization and Automation.

Further information may be obtained from:

Studieselskapet for Norsk Industri (SNI),  
Forskingsveien 1, Oslo, Norway.

## Switzerland

### SYMPOSIUM ON AUTOMATIC CONTROL IN METROLOGY AND MACHINE-TOOLS

The 16th Information Symposium of ASSPA (Association Suisse pour l'Automatique - Swiss Association of Automatic Control) taking place in Spring 1965 is devoted to Automatic Control in Metrology and Machine-Tools. The programme provides for 2 days of sessions, the first day being devoted to papers on fundamentals and theory, whilst the discussions of the second day are more particularly oriented towards application problems. Some industrial firms have been invited to cooperate through their representatives.

### SYMPOSIUM ON CONTROL IN NUCLEAR ENERGY PLANTS

The 17th Information Symposium of ASSPA is provided for the Autumn 1965 and will be devoted to problems of control in nuclear energy plants. The Association Suisse pour l'Energie Nucléaire (Swiss Association for Nuclear Energy) has accepted to cooperate in organizing this event.

- The first day will be devoted to general problems such as:
  - Synthesis of nuclear measurement methods
  - Reactor control techniques
  - Control techniques with nuclear measurements
- The second day will be devoted to practical problems and will be combined, if possible, with a visit of the Würenlingen plants.

## United Kingdom

### BRITISH AUTOMATION CONFERENCE

The British Automation Conference will be held at Eastbourne from the 7th to the 10th of November 1965. The conference, which was previously announced under the title 'Men, Machines and Automation' is organized by the Institution of Production Engineers, and is sponsored by the British Employers' Confederation, the Federation of British Manufacturers, the Trades Union Congress, and the United Kingdom Automation Council. The Department of Scientific and Industrial Research is represented on the Planning Committee.

The conference will place emphasis on social and economic problems and will be based on four themes: Automation and Society; Automation and Production; Automation and the Market; and Automation and Management. The conference is a natural successor to the 1955 Margate Conference on 'The Automatic Factory: what does it mean?'

Those wishing to reserve accommodation may obtain a full list of hotels in Eastbourne from:

The Conference Secretary,  
1965 British Automation Conference,  
Institution of Production Engineers,  
10, Chesterfield Street,  
Mayfair, London, W.1.

### SYMPOSIUM ON AUTOMATIC CONTROL IN ELECTRICITY SUPPLY

A Symposium on Automatic Control in Electricity Supply, arranged by the North Western Centre of the Institution of Electrical Engineers under the aegis of the United Kingdom Automation Council, will be held at the Renold Building, Manchester College of Science and Technology, Manchester, from 9th to 31st March, 1966. Details are given below:

#### AIM:

To present and discuss the most recent experience in operation and practical-design aspects of automatic control in the supply of electric power, and to express views and expectations on possible future trends. It is intended to hold also an exhibition of suitable equipments and to arrange organized visits to power-station plants and to manufacturers' works.

SCOPE:

- (1) Automatic control in transmission and distribution supply networks (automatic switching and automatic loading).
- (2) Automatic control in generating stations (starting up and shutting down); control of running plant under steady-state and fault conditions; optimisation of efficiency in the running of a power station.
- (3) Kindred problems and future trends.

FURTHER DETAILS AND REGISTRATION FORMS

Will be available a few weeks before the Symposium, from the Honorary Secretary of the Symposium Organizing Committee, Dr. R. Feinberg, Transformer Division, Ferranti Ltd., Hollinwood Avenue, Chadderton, Lancs., England.

USA

OPERATIONS RESEARCH SOCIETY OF AMERICA CONFERENCE

The Operations Research Society of America will hold its 27th Annual Meeting in Boston from 6th to 7th May, 1965. The theme will be 'New Directions in Operations Research'. The progress of operations research in fields other than military has been varied, rapid in some instances, slow in others. During the past six years or so, Operations Research has acquired new sponsors, new techniques, new concepts and new equipment; and people specifically trained in operations research have begun to enter the profession in large numbers. New computer systems of greatly increased flexibility, economy and capacity have broadened the range of application of data processing from the small independent business to the world-wide military control system. The 27th Annual Meeting of ORSA will focus on these New Directions in Operations Research.

For further information apply to:

Operations Research Society of America,  
Mt. Royal and Guilford Avenues,  
Baltimore, Maryland 21 202, U.S.A.

USSR

3rd ALL-UNION CONFERENCE ON AUTOMATIC CONTROL

The National Committee of Automatic Control of the USSR announces the 3rd All-Union Conference on Automatic Control (technical cybernetics) to be held from 20th to 26th September 1965. The scientific programme of the Conference includes the presentation of about 200 technical papers dealing with the actual problems of automatic control as well as round-table discussions. The meetings will take place on board the steam-boat 'Admiral Nakhimov' which is to steam along the Black Seashore from Odessa to Batumi and back with stoppings at some resort towns (Sochi, Yalta and others). It is supposed that more than a thousand delegates will participate in the Conference. For further information apply to:

Organizing Committee,  
USSR National Committee of Automatic Control,  
Kalanchevskaya ul. 15a, Moscow B-53, USSR.

**WORLDWIDE AUTOMATIC CONTROL**  
**Reports on past**  
**International Conferences**

INTERNATIONAL ELECTRONIC COMPONENTS EXHIBITION

An exhibition of Electronic Components takes place in Paris from 6th to 13th April 1965, concurrently with an International Colloquium on Memory Techniques (5th to 10th April; see below), and with the International Exhibition of Electro-Acoustic Equipment.

The exhibition is organized by the Société pour la Diffusion des Sciences et des Arts (S.D.S.A.), 16 Rue de Presles, Paris 15, under the aegis of the Fédération Nationale des Industries Electroniques, and with the cooperation of specialist manufacturer associations.

INTERNATIONAL COLLOQUIUM ON MEMORY TECHNIQUES

The Société Française des Electroniciens et Radio-Electriciens and the Fédération Nationale des Industries Electroniques organize an International Colloquium on Memory Techniques in Paris from 5th to 10th April, concurrently with the Electronic Components and Electro-Acoustic Equipment Exhibition (see above). The Colloquium is divided as follows:

Fundamental Materials and Processes (e.g. Magnetism, Ferroelectricity, Semiconductor, Electron Optics, Supra Conduction).

Components, the following sub-headings: Commutation speed, Consumption, Sorting of Information, Bulk, Thermal Behaviour, Association and Integration Possibilities, Reliability. Devices and Mechanisms (Organization and execution of memories, Associated Access Electronic Mechanisms, Techniques of Applications of Memories).

In addition, some analogical and numerical uses of cones in electrical, chemical, hydraulic, and pneumatic fields may be subjects of papers.

INTERNATIONAL CONFERENCE ON PROGRAMMING AND CONTROL

The International Conference on Programming and Control is being held at the United States Air Force Academy, Colorado, from 15th to 16th April, 1965. It is organized by the University of California and the United States Air Force.

Mathematical programming techniques have gained wider recognition in recent years as highly effective tools for the solution of a broad class of complex problems in management sciences and operations research. By contrast, these techniques have so far found relatively little application in control

system design and optimization largely because of a lack of effective communication between control theorists and mathematical programming. A major aim of this Conference is to stimulate a wider use of mathematical programming techniques in control system design and optimization by providing a forum for the presentation of both original and expository papers dealing with applications of linear, nonlinear, stochastic, integer, and dynamic programming to various types of control problems. Among the principal subjects covered by the Conference are the following:

- (1) Application of various mathematical programming techniques to the solution of control problems;
- (2) New advances in control theory, with emphasis on techniques which have a bearing on the application of mathematical programming to optimal control and related areas;
- (3) New advances in mathematical programming, with emphasis on techniques which are relevant to control applications;
- (4) Use of computers and computer programming in control systems.

### Announcements of future international Conferences

#### INTERNATIONAL EXHIBITION OF INDUSTRIAL ELECTRONICS

An International Exhibition of Industrial Electronics (INEL 65) will be held in Basle from 7th to 11th September 1965. There will be four main categories of exhibit, viz.: Components; Electronic Measurement; Electronic Devices and Industrial Applications; Technical Literature.

Further information may be obtained from:

INEL 65,  
4000 Basle 21, Switzerland.

#### THIRD AUSTRALIAN COMPUTER CONFERENCE

The Australian National Committee on Computation and Automatic Control is sponsoring its Third Australian Computer Conference which will be held in Canberra during May 1966. Papers will be read on the following topics:

- (1) Recruitment, Education and Utilization of Staff;
- (2) Programme languages and programme details;
- (3) System design and implementation;
- (4) Application of Computers and Automatic Systems;
- (5) Social implications of Computers.

Authors are invited to submit summaries of papers. Further particulars may be obtained from:

Dr. G.N. Lance,  
Computing Research Section, CSIRO,  
P.O. Box 109, Canberra City, ACT, Australia,

to whom summaries should be sent not later than 31st May, 1965.

## PUBLICATIONS

### International

#### Automation: Methodology and Research

Published by the International Labour Organisation Automation Group, Geneva, 300 pages, 1964

For the first time in the series "Labour and Automation", the I.L.O. Automation Group of the Research and Planning Department has published, towards the end of 1964, a remarkable book under the title "Automation: Methodology and Research". The work is an outcome of a meeting held by I.L.O. automation experts in March 1964 and is devoted to the study of automation in its social, educational and economic aspects.

In spite of their importance, these problems are little if not at all, known to persons directly affected by them. Although this publication is mainly addressed to researchers in problems of methodology, the thorough and complete survey made by the I.L.O. deserves to be widely circulated among works managers, engineers and labour organisers. The problems of how to approach the study of social consequences of automation are handled in a very objective and scientific way. In spite of considerable difficulties met by the experts during their field investigations, the material contained in this book allows to reach very important conclusions. A full and systematic bibliography concludes the volume.

The explosive development of automation in the post-war period has contributed to a considerable technical advancement of production means. The experts were concerned with methods of distinguishing future trends in technological developments, since the rapid pace of changes was likely to affect a growing number of workers in the near future. Adaptation of qualified able men-power to these new conditions, shortage of qualified specialists, elimination of social conflicts - all these factors are handled in the reviewed work clearly and soberly.

The first chapters are concerned with generalities and definitions (by P.E. Sulvan and P. Irason); with somestudies made in France (P. Naville) and with effects of automation on labour (W.M. Larke). A study on Vocational Training and Automation (Iven Grabe) closes the chapter. This study was carried out by the C.I.R.F. for the E.S.C.S., using question sheets worked out in cooperation with the E.C.S.C. for the Steel and Iron industry. Samples of the question sheets are given in the appendix.

Next chapters deal with enquiries conducted on a national level in Canada, in the U.S.A., in the U.K., and in the U.S.S.R. It is very interesting to compare methods of investigation worked out in countries differing so much in their economic



structure. The authors responsible are: J.P. Francis for Canada, L. Greenberg and E. Weinberg for the U.S.A., J.L. Edwards for the U.K. and A. Zvorykine for the U.S.S.R.

Then follow papers concerning the evaluation of retraining methods (G.G. Somers) and methods for evaluating the effectiveness of various methods and programmes designed to deal with the impact of automation (E. Pettersson). The latter discusses in some details the results of various programmes to encourage labour mobility, carried out in Sweden.

No lesser interest is arisen by investigation concerning the impact of automation on economic development of some technically younger countries in Africa and Asia (S.A. Palekar). The author mentions the pitfalls and difficulties met by researchers in such countries and shows some particular methods of conduct in this important and complicated branch of research.

The concluding chapter contains a very comprehensive condensed view on conclusions reached by the group of automation experts who have discussed the numerous reports and enquiries carried out in various countries within the framework of this investigation.

Readers will close the book with the gratifying feeling that systematic work of suggested lines, conducted in parallel with technical advance in applied automation, will enable us to assimilate and to humanize these new technical trends, instead of being lead into a long period of difficult adaptation. For this reason alone the work deserves a careful study and the widest diffusion.

Many specialists will certainly respond to the appeal of the I.L.O. Automation Group to cooperate with them for mutual benefit.

(Contributed by M. Ajnbinder)

PROCEEDINGS

of the

SECOND CONGRESS OF IFAAC

Basle, 1963

Please see enclosed prospectus of the publishers Butterworths, London, and R. Oldenbourg, Munich and Vienna. The Proceedings, published under the title

"Automatic and Remote Control"

include two volumes: The volume "Applications and Components" appeared in 1964, the volume "Theory" has just been issued.

**Belgium**

The following printed COURSES ON AUTOMATIC CONTROL are available from I.B.R.A. (Institut Belge de Régulation et d'Automatisme - Belgian Institute of Automatic Control), 3 rue Ravenstein, Brussels. Part of these courses are in French, others being in Flemish; the prices are indicated in FB (Belgian Francs).

"Cours sur les systèmes asservis" (in French)  
("LECTURES ON AUTOMATIC CONTROL SYSTEMS") by Messrs. Charles, d'Alard, Godfrind, Heuskin, Hubaut, Passau, Peretz, Peters, van der Waeteren and Willems, comprising:

- Abstracted terminology
  - Mathematical fundamentals
  - Basic properties of automatic control systems
  - Investigation procedures for automatic control systems and their elements
  - Typical examples of automatic control systems
- Price: FB 700

"Cours sur la technologie des appareils de régulation industrielle" (in French)  
("LECTURES ON THE TECHNOLOGY OF INDUSTRIAL AUTOMATIC CONTROL DEVICES"), comprising:

- (1) Measuring instruments:
  - Measurements of pressures, levels and specific weights by J. Hurtgen FB 100
  - Measurements of flows by R. Massart FB 170
  - Measurements of temperatures by J. Fatchamps FB 300
- (2) The technology of control devices:
  - Control of pressures, levels and densities by J. Hurtgen FB 120
  - Pneumatic control of flows by E. Buchet FB 270

The following two books are, more especially, intended for technicians:

- "Nooittechniek" (in Flemish)  
("MEASURING TECHNIQUES"), comprising:
    - Algemene inleiding (General introduction)
    - Dablmetingen (Flow measurements)
    - Druck - en pelmetingen (Pressure and level measurements)
    - Temperatuurmetingen (Temperature measurements)
    - Regelkleppen (Control valves)
- Price: FB 400

- "Regeltechniek" (in Flemish)  
("CONTROL TECHNIQUES"), comprising:
    - De Voornaamste Regelakties (The main control actions)
    - De Pneumatische Regelars (The pneumatic controllers)
    - De Elektrische Regelars (The electric controllers)
- Price: FB 400

France

1.1.6.0. V.V. Solodovnikov: Dynamique statistique des systemes lineaires de commande automatique (STATISTICAL DYNAMICS OF LINEAR AUTOMATIC CONTROL SYSTEMS). Translated from Russian into French, Paris, Dunod, 1965, 646 p., 226 illus., 98 F.

United Kingdom

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Attention is drawn to the following papers of which reprints may be obtained free of charge from:

- The Director,
- Engineering Experiment Station,
- Mechanical Engineering Building,
- University of Wisconsin,
- Madison, Wisconsin, U.S.A.

A RESUME OF THE BASIC LITERATURE ON NONLINEAR SYSTEM THEORY (WITH PARTICULAR REFERENCE TO LYAPUNOV'S METHODS) by Thomas J. Higgins, University of Wisconsin. (Reprint No. 434)

A BIOGRAPHICAL BIBLIOGRAPHY OF ELECTRICAL ENGINEERS AND ELECTROPHYSICISTS (Part I: Books, Part II: Periodical Items) by T.J. Higgins in s. Reprinted from 'Technology and Culture' vol. 2, 1961, pp. 28-32; 146-165. (Reprint No. 444)

A RESUME OF THE LITERATURE ENROLLING USE OF DYNAMIC PROGRAMMING IN AUTOMATIC CONTROL THEORY by T.J. Higgins in s. Reprinted from Proceedings of the 'Workshop on Dynamic Programming in Automatic Control Theory' (Boulder, Colo., June 1961) Purdue University Press, Lafayette, Ind., 1962, pp. 207-224. (Reprint No. 538)

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