

IFAC
INTERNATIONAL FEDERATION
OF AUTOMATIC CONTROL

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Editor: Professor Ing. Dr. V. Broida
Honorary Editor of IFAC

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IFAC NEWS

The Second International Congress of Automatic Control

IFAC organized its Second Congress at Basle, Switzerland, from August 28th to September 4th, 1963. The material side of the organization was in the hands of the Swiss Federation of Automatic Control which handled this task excellently together with the Congress Secretary Dr. A. von Sc h u l t h e s s and his staff. About 1500 participants, accompanied by 200 ladies, attended the Congress. They came from the following 32 countries, 27 of which have national organizations as members of IFAC:

Argentina	1	participants	Japan	23	part.
Austria	11		Mexico	1	
Belgium	38		Netherlands	88	
Bulgaria	8		Norway	24	
Canada	8		Poland	32	
China	10		Portugal	3	
Congo	3		Rumania	8	
(Léopoldville)			Spain	6	
Czechoslovakia	12		Sweden	44	
Denmark	10		Switzerland	237	
Finland	27		Turkey	8	
France	173		United Arab Republic	1	
Germany	212		United Kingdom	158	
Hungary	30		USA	154	
India	2		USSR	80	
Israel	4		Yugoslavia	32	
Italy	47			<hr/>	
				1,495	

NOTE ON INFORMATION BULLETIN NO. 17
Information to appear in the Information Bulletin No. 17 should reach the Editor:

Professor Dr. Ing. V. Broida
Honorary Editor of I.F.A.C.,
13, rue de la France-Mutualiste
Boulogne-sur-Seine (Seine), France,

not later than 15th February, 1964.

At the opening session on August 28th, welcoming addresses were delivered by Prof. Dr. H.P. F s c h u d i, Federal Councillor, on behalf of the Swiss Federal Government, and by Dr. Ed. W y s s, State Councillor, on behalf of the State and Town of Basle. Following this, Mr. H. C h e s t n u t, USA, first President of IFAC (1957-1959) recalled the foundation of the Federation, Prof A.M. L e t o v, USSR, second President of IFAC (1959-1961), recalled the first IFAC Congress of Automatic Control held at Moscow in 1960, and Prof. Ed. G e r e c k e, Switzerland, third President of IFAC, spoke on the Second IFAC Congress organized under his leadership.

Mr. H. C h e s t n u t, USA, Prof. A.M. L e t o v, USSR, Dr. G. R u p p e l, Germany, Honorary Secretary of IFAC, and Prof. V. B r o i d a, France, Honorary Editor of IFAC and past Chairman of the IFAC Provisional Committee (1956-1957), were given presents by Prof. G e r e c k e, Switzerland, on behalf of IFAC in token of gratitude of the Federation for their respective

activities. We publish on page 17 reproductions of the diploma in English, Russian, German, and French respectively, delivered on this opportunity by Prof. Gerrecke.

Every half-day group of working sessions, devoted to discussion papers, was preceded by a plenary session open to all the participants in the Congress and devoted to a survey paper. After that, the participants of the plenary session formed four groups, each group attending one of the 4 parallel working sessions, in which 159 discussion papers (preprints of which had been mailed well ahead of the date of the Congress) were shortly summed up by their authors and discussed by the audience of altogether 50 working sessions.

In this way, 12 survey papers were read at the 11 plenary sessions of the Congress. They were respectively devoted to:

- "Applications of automation and automatic techniques to metal rolling and processing" by W.E. Miller (USA) and "Achievement in automation of steel industry" by Prof. A. Ia. Lerner (USSR)
- "Reliability of components" by Prof. B.S. Sotnikov (USSR), Prof. H. Weismann (Germany) and G. Glinski (Canada)
- "Chemical and petroleum industries" by H.W. Slobodov, J.J. de Jong, J.A. Landstra, J.E. Rijnsdorpe and A.C. Timmeris (Netherlands)
- "Stochastic methods in automatic control" by Prof. V.S. Puchachev (USSR)
- "New design principles and control devices" by Prof. J.L. Sheerer (USA) and 16 American, German and Russian co-authors
- "Learning systems" by Dr. A.G. Pask (United Kingdom)
- "Adaptive and self-optimizing systems" by Prof. J. Tuxalka (USA)
- "Applications of automatic control to electric utility systems" by B. Favez (France)
- "The information revolution and its impact on automatic control" by I.L. Auerbach (USA), President of IFIP (International Federation of Information Processing)
- "Synthesis of optimal regulators (survey of the main problems)" by Prof. A.M. Letov (USSR)
- "Process dynamics and its application to industrial process design and process control" by T.J. Williams (USA)

The 83 discussion papers on Theory were presented at 25 sessions. They led to a total of 200 discussions by the audience, several papers leading to 6, 7 or 8 discussions each and one paper having even been followed by 16 discussions.

The 55 discussion papers on Applications were presented at 19 sessions. They led to a total of 166 discussions, some papers being currently followed by 5 or 6 discussions and, less frequently, by 7 or 8 discussions each.

The 21 discussion papers on Components were presented at 6 sessions. They led to a total of 44 discussions, some papers being currently followed by 4 or 5 discussions each and one paper having led to 11 discussions.

The mailing of preprints well ahead of the date of the Congress obviously facilitated the discussion of papers. Indeed, most of them thoroughly prepared beforehand and many of them became in fact additional Congress papers. The work of collecting, and eventually translating and putting into shape the numerous and sometimes very long discussion remarks and author's replies was successfully carried out, with remarkable speed and accuracy, by a team of 16 devoted scientific secretaries mostly coming from the Technische Hochschule of Zürich and Darmstadt and from the University of Cambridge, who were most actively supervised and guided by Dipl. Ing. E. Rutsch, of Zürich, whose activity should be specially pointed out.

In the course of the closing sessions held on September 4th, reports on the results and conclusions of the Congress were presented:

- in the field of Theory by Acad. B.N. Petrov (USSR), Chairman, and Prof. J.H. Westcott (United Kingdom), Vice-Chairman of the IFAC Technical Committee on Theory,
- in the field of Applications, by Mr. W.E. Miller (USA), Chairman of the IFAC Technical Committee on Applications,
- in the field of Components, by Mr. Gy. Boromisz (Hungary), Chairman, and Prof. Y.OSHIMA (Japan), Vice-Chairman of the IFAC Technical Committee on Components.

The closing remarks of the retiring President of IFAC, Prof. Ed. Gerrecke, ended this Congress.

In the course of the Congress Gala dinner, on September 3rd, the incoming fourth President of IFAC, Mr. J.F. Coles (United Kingdom), warmly thanked Prof. Gerrecke for all the achievements of IFAC under his leadership and conveyed to him and to the Swiss Federation of Automatic Control all the gratitude of IFAC for the perfect organization of the Congress and for their very friendly hospitality. On behalf of IFAC he gave to Professor Gerrecke, a present in token of gratitude of the Federation for his activities. The diploma, which is in the German language, is reproduced on the following page.

THE INTERNATIONAL FEDERATION
OF AUTOMATIC CONTROL

IFAC

DANKT IHREM DRITTEN PRÄSIDENTEN

PROFESSOR EDUARD GERECKE

HERZLICH FÜR DIE GROSSEN LEISTUNGEN,
DEREN ER SICH IN DER FÜHRUNG DER
VEREINIGUNG IN DEN JAHREN 1961 BIS 1963
VERDIENST GEMACHT HAT. ♣ SIE SPRICHT IHM
INSBESONDERE FÜR DIE AUSGEZEICHNETE
DURCHFÜHRUNG DES ZWEITEN KONGRESSES
IN BASEL IHRE ANERKENNUNG AUS. ♣
SIE FREUT SICH, IHM ALS ZEICHEN IHRER
VERBUNDENHEIT EINEN HANDGEMALTEN
PORZELLANTELLER ZU ÜBERREICHEN

BASEL, DEN 4. SEPTEMBER 1963

DER 4. PRÄSIDENT DER IFAC:

Eduard Gerecke

DER SCHATZMEISTER DER IFAC:

Richard Ciernia

The Congress offered also the opportunity of attending several social events amongst which an outstanding theatre performance and a remarkable reception dinner offered at Birmingen Castle by the Swiss Federation of Automatic Control to past and present IFAC executives should be mentioned. Cultural and industrial half-day tours took place during the Congress, after which whole-day industrial tours in Switzerland and visits to neighbouring countries - France, Germany and Italy - were arranged for the participants. An excellent ladies programme was prepared and carried into effect under the very active supervision of Mrs. Cunéod.

The Proceedings of the Congress are expected to be published early in 1964 by Butterworths Scientific Publishers, 4-5 Bell Yard, Temple Bar, London W.C. 2, for the Western version (mostly in English, with 10 discussion papers in French). The Editor is Prof. Dr. V. Baroldi (France) and the co-editors are: Mr. Derek Barlow (United Kingdom) and Prof. Dr. O. Schäfer (Germany).

The Russian version will be published by the USSR Academy of Sciences (Editor: Acad. V.A. Trapeznikov).

Both versions, co-ordinated to the maximum extent possible, will comprise 2 volumes: No. 1 (Theory) and No. 2 (Applications and Components).

We list hereafter - by topics and not in the order in which they were actually presented at the Congress - the 159 discussion papers which will be published, with their discussions - in addition to the 12 survey papers mentioned above - in the Proceedings.

List of Discussion Papers presented at the 2nd IFAC Congress

PART I: THEORY

1. NON-LINEAR SYSTEM THEORY
 - 1.1. Describing function technique
 - Lauber, R. (Germany): A new method to derive the describing function of certain non-linear transfer systems.
 - Leonhard, A. (Germany): Extension of the describing function method to the investigation of parametric oscillations.
 - Gibson, J.E., di Tada, E.S. (USA): On the inverse describing function problem.
 - Bonnen, Z. (Israel): Relative stability of oscillations in non-linear control systems.

- 1.2. Prediction systems
 - Adey, A.J.; Coales, J.F.; Stiles, J.A. (United Kingdom): The control of two-variable on-off systems.
 - Horing, S. (USA): On the design of predictor control systems.
 - Gulko, F.B.; Kogan, B.Ia. (USSR): Method of optimum control with prediction.
 - Farmer, E.D. (United Kingdom): A method of prediction for non-stationary processes and its application to ETC.
- 1.3. Non-linear systems with random parameter estimates
 - Kulikowski, R. (Poland): Optimization of non-linear random control processes.
 - Andreev, N.I. (USSR): Non-linear programming in problems of studying optimum automatic control systems.
 - Merklinger, K.J. (United Kingdom): Numerical analysis of non-linear control systems using the Fokker-Planck-Kolmogorov equation.
 - Flake, R. (USA): Volterra series representation of time-varying non-linear systems.
- 1.4. Non-linear stochastic systems
 - Smith, H.W. (Canada): The application of quasi-linear methods to non-linear feedback systems with random inputs.
 - Prasad, T.; Sinha, V.P. (India): A digital procedure for the study of non-linear systems for random processes.
 - Novoseltsev, V.M. (USSR): Systems optimal in terms of speed in the presence of random noise.
2. THEORY OF DISCRETE SYSTEMS
 - 2.1. Discrete systems
 - Strejc, V. (Czechoslovakia): Quasi-invariant hybrid multi-parameter.
 - Friedland, B. (USA): Optimum control of discrete-time dynamic processes.
 - Desoer, C.A.; Polak, E.; Wang, J. (USA): Theory of minimum-time discrete regulator.
 - 2.2. Sampled-data systems
 - Jury, E.I. (USA): On the roots of a real polynomial inside the unit circle and a stability criterion for linear discrete systems.
 - Kondō, B.; Iwai, S. (Japan): Analytical approaches to non-linear sampled-data control systems.
 - Brown, B.M. (United Kingdom): Continuous compensation of feedback sampled-data linear control systems.

- Pyspkin, Ia., Z. (USSR): Fundamentals of theory of non-linear sampled-data systems.
 - Volgin, L.M. (USSR): Synthesis of optimal sampled-data systems.
 - Li, C.C.; Jones, R.W. (USA): Integral pulse-frequency modulated control systems.
 - Peterka, V. (Czechoslovakia): Combination of finite settling time and minimum integral of squared error in digital control systems.
- 2.3. Relay systems
 - Gille, J.C. (France), Wegrzyn, S. (Poland), Paquet, J.C. (Canada): Oscillations sous-harmoniques des asserissements par plus ou moins (Subharmonic oscillations in on-off control systems).
 - Persson, E.V. (Sweden): Synthesis of control systems operating linearly for small signals and approximately "bang-bang" for large signals.
 - Gaylord, R. (USA): Dual input systems with a saturation constraint.
 - 2.4. Theory of finite automata
 - Gavrilov, M.A. (USSR): Signalization and prediction in discrete control systems with structural redundancy.
 - Mošlil, G.C. (Rumania): Axiomatization of the theory of simplification of combinational automata.
 - Paszkowski, S. (Poland): Adaptive control of systems with a definite number of parameters.
 3. THEORY OF OPTIMAL SYSTEMS
 - 3.1. Optimal systems
 - Westcott, J.H.; Florentin, J.J.; Pearson, J.D. (United Kingdom): Approximation methods in optimal and adaptive control.
 - Kelley, H.J.; Dunn, J.C. (USA): An optimal guidance approximation for quasi-circular orbital rendezvous.
 - Neustadt, L.; Palewonsky, B. (USA): On synthesizing optimal controls.
 - Meditch, J.S. (USA): An application of optimal control to midcourse guidance.
 - Lee, E.B. (USA): On necessary and sufficient conditions for time-optimal control of second-order nonlinear systems.
 - Sarachik, P.E.; Kranc, G. (USA): On optimal control of systems with multi-norm constraints.
 - Alimov, Iu.I. (USSR): Approximate calculation of a class of automatic systems with forced optimization of the parameters.

- 3.2. Optimal systems with distributed parameters
 - Maracaci, R. (Italy): Some considerations on optimized integrated control.
 - Krasovskii, N.N. (USSR): Optimal processes in systems with time delay.
 - Butkovskii, A.G. (USSR): Optimum control of systems with distributed parameters.
- 3.3. Synthesis of optimum systems
 - Sakawa, Y., Hayashi, C. (Japan): Synthesis of optimum control systems by using Pontryagin's maximum principle.
 - Stratanovich, R.L. (USSR): Dynamic programming methods and their application to the synthesis of optimal systems.
 - Chang, S.S.L. (USA): A modified maximum principle for optimum control of systems with bounded space conditions.
 - Flugge-Lotz, I., Titus, H.A. (USA): Optimum and quasi-optimum control of third- and fourth-order systems.
- 3.4. Optimal programming
 - Barbashin, E.A. (USSR): Programmed control and theory of optimum systems.
 - Pospelov, G.S. (USSR): Realization of optimum programs in systems of automatic control.
 - Guignabodet, J. (France): Some bounds on quantization errors in dynamic programming computations.
- 4. THEORY OF SELF-ADJUSTING SYSTEMS
 - 4.1. Invariant problems in self-adjusting systems
 - Kuntsevich, V.M., Kremenuko, In.V. (USSR): Invariancy theory of self-adjusting (pulse) systems.
 - Petrov, B.N., Ulanov, G.M., Emelianov, S.V. (USSR): Invariancy and optimization in automatic systems with non-flexible and variable structure.
 - Meierov, M.V. (USSR): Synthesis of systems with fixed structure of equivalent self-adjusting systems.
 - 4.2. Self-adjointing systems
 - Mesch, F. (Germany): A comparison of the measuring time in self-adjusting control systems.
 - Popov, E.P., Loskutov, G.M., Inupov, O.M. (USSR): On self-adjointing control systems without searching tentative action.
 - Chichinadze, V.K., Charviani, O.A. (USSR): A contribution to the use of self-adjusting systems for the mechanical synthesis of control systems.

- Voronov, A.A., Ignatiev, M.I. (USSR): On finding function extremums in automatic systems.
- Straszak, A. (Poland): Dominant operators approach to the theory of adaptive control systems.
- Eweleigh, V.W. (USA): General stability analysis of sinusoidal perturbation extrema searching adaptive systems.
- Klubnikin, P.F. (USSR): The realization of a self-adapting control programme in a system with a digital computer.
- 4.3. Learning systems
 - Taylor, W.K. (United Kingdom): A pattern - recognizing adaptive controller.
 - Andraee, J.H. (United Kingdom): Stella: a scheme for a learning machine.
 - Aizerman, M.A. (USSR): Learning systems of automatic control in the light of experiments on teaching systems to identify patterns.
- 4.4. Hill-climbing technique
 - Kazakov, I.E., Evlanov, I.G. (USSR): On the theory of self-adjusting systems with search for gradient by the method of auxiliary operator.
 - Krasovskii, A.A. (USSR): Problems in the theory of continuous systems of extremum process control.
 - Perret, R. (France), Rouxel, R. (Switzerland): Principles of application of an extremum-calculating computer (automatic search of optimum operating conditions)
 - Feldbaum, A.A. (USSR): On theory problems for dual control.
 - van den Grinten, P.M.E.M. (Netherlands): The application of random test signals in process optimization.
- 5. TECHNIQUES FOR SYSTEM STABILITY ASSESSMENT
 - Iasalle, J.P. (USA): A new concept of stability.
 - Nour-Eldin, H. (Switzerland): Non-linear stability analysis for restricted non-linearities using the second method of Liapunov.
 - Nesbit, R.A. (USA): The use of the technique of linear bounds for applying the direct method of Liapunov to a class of non-linear and time-varying systems.
 - Ling, H. (China): On the estimation of the decaying time.
 - Szegö, G.P. (Italy): Method of applying Liapunov's second method to the stability analysis of time-invariant control systems.
 - Rosenbrock, H.H. (United Kingdom): A method of investigating stability.

6. SYSTEM DYNAMICS AND OTHER PROBLEMS

6.1. System dynamics

- Blandhol, E., Balchen, J.G. (Norway): Determination of system dynamics by the use of adjustable models.
- Loeb, J. (France): Les erreurs systématiques et aléatoires dans la détermination expérimentale des fonctions de transfert (Systematic and random errors in transfer function experimental determination).
- Pélégriin, M. (France): Notes sur une fonction aléatoire d'aspect physique (Notes on a random function having a physical aspect).
- Veltman, B.P.T., van den Bos, A. (Netherlands): The applicability of the relay correlator in automatic control.
- Quarnström, B. (Sweden): An uncertainty relation for linear mathematical models.

6.2. General problems

- Roxin, E. (Argentine): Axiomatic foundation of the theory of control systems.
- Jarominek, W. (Poland): Inversion of the quadratic evaluation of transfer processes with integrals.
- Beneš, J. (Czechoslovakia): On systems with automatic control of configuration.
- Pavlik, E. (Germany): Approximation of industrial control systems to optimum non-linear control with conventional controllers.
- Lefèvre, P.M. (France): Nouvelle procédure d'optimisation statique fondée sur la transformation $Z^{-1}/Z+1$ (New static optimization procedure based on the $Z^{-1}/Z+1$ transform).
- Kerr, C.N., MacLellan, G.D.S. (United Kingdom): The control of output - dependent processes.

PART II: APPLICATIONS

1. IN THE ELECTRIC UTILITY FIELD

- 1.1. Electricity and nuclear reactor control
 - Venikov, V.A., Tsukernik, L.V. (USSR): The development of methods of cybernetic control for integrated electric power systems.
 - Vámos, T., Benedikt, S., Uzsoki, M. (Hungary): Some recent results in the computer control of energy systems.
 - Kirchmayer, I.K., Ringler, R.J. (USA): Optimal control of thermal-hydro system operation.
 - Krug, G.K., Netushil, A.V. (USSR): To the theory of self-adjusting systems.

- Turpin, T., Thilliez, J. (France): Principes et réalisation des automatismes liés à la manutention de combustible d'un réacteur nucléaire (Principles and embodiment of nuclear reactor fuel-handling automatic devices).
- MacPherson, P.K., Muscettola, M. (United Kingdom): A study of the dynamics of steam voids in boiling water nuclear reactors.

1.2. Hydro-system control

- Ruge, H. (Norway): On the optimal control of hydro-electric power systems.
- Tschumy, A. (Switzerland): Description of a graphical method to investigate stability conditions of a hydro-electric system.
- Glavitsch, H. (Switzerland): Digital investigation of multi-machine power systems.
- Stein, T. (Switzerland): Optimizing control of water-turbine governors considering the non-linearity of servo-motor speed.
- Borel, L. (Switzerland): Equations of regulation of a hydro-electric installation with fixed reference values.

2. IN THE STEEL INDUSTRY

- Degregorio, G., Littigio, G., Sironi, G. (Italy): Control for sintering mixture preparation.
- Korobko, M.I., Samoilenko, Iu. (USSR): On the dynamic planning of open-hearth plant.
- Wistreich, J.G., Tomlinson, A. (United Kingdom): Automation of heavy forging.
- Herson, S.E., Massey, R.G. (United Kingdom): Automation in a steel works with special reference to the use of digital computers for production scheduling and information transmission.
- Beadle, R.G. (USA): On-line computer control of a hot-strip finishing mill for steel.
- Lerner, A.Ia. (USSR): Optimal control for continuous processes.
- Domanitskii, S.M., Imedadze, V.V., Tsintsadze, Sh.A. (USSR): Digital optimal system of programmed control and its application for blooming mill screwdown devices.
- Bradford, J.T. (USA): Computer control of the continuous annealing process.

3. IN THE CHEMICAL AND OIL INDUSTRIES

- Izawa, K., Morinaga, T. (Japan): Dynamic characteristics of binary distillation column.
 - Moczek, J.S., Otto, R.E., Williams, T.J. (USA): Approximation models for the dynamic response of large distillation columns.
 - van der Heyden, C.A.J.M., van Nes, A.G. (Netherlands): A study on the dynamic behaviour of a catalytic cracker power-recovery system by means of an analog computer.
 - Booth, R.C., Sollecito, W.E. (USA): Statistical analysis of a novel fluid flow control system.
 - Takamatsu, T., Nakanishi, E. (Japan): Effects of fluid mixing and its expressions on dynamics of mass transfer process.
 - Delvaux, L. (Belgium): Etude expérimentale du comportement dynamique d'un échangeur de chaleur et d'un processus de mélange. (Experimental study of the dynamic behaviour of a heat exchanger and of a mixing process).
 - Volter, B.V. (USSR): Automation of polyethylene production under high pressure.
 - Anisimov, E.V. (USSR): The studies of dynamics and statics of the rectification process.
 - Kylstra, F.J. (Netherlands): Controllability and allowable compressor capacity of a flare gas recovery system.
 - Isobe, T., Totani, T. (Japan): Analysis and design of a parameter perturbation adaptive system for application to process control.
 - Zavora, J. (Czechoslovakia): The dynamics properties of rectification stations with plate columns.
 - Montjean, F. (France): Une réalisation originale dans une raffinerie de pétrole: le chargement automatique des wagons-citernes (An original achievement in an oil refinery: the automatic loading of tanker wagons).
4. AUTOMATION IN INDUSTRIAL PROCESSES
- 4.1. Computers on-line and off-line
- Honoré, E. (France): Le traitement du problème d'optimisation par A 110. (The optimizing problem processing by the A 110.).
 - Phillips, R.A. (USA): Automation of a Portland cement plant using a digital control computer.
 - Smith, R.K., Nahi, N. (USA): On the stability and design of dither adaptive systems.

4.2. Steam system control

- Kindermann, W. (Germany): Prediction of control results with superheaters of a steam generator.
- Fujii, S., Kanda, N. (Japan): Optimizing control of boiler efficiency.
- Ehling, J. (Germany): Simulator for turbines with intermediate superheater and controlled steady withdrawal of steam for other purposes.
- Egeberger, M.A., Troutman, P.H. (USA): An electro-hydraulic control system for reheat turbines.

4.3. Automatic industry

- Casch, J. (France): L'équipement électronique de commande d'une machine à équilibrer les vilebrequins (Electronic control equipment of a crankshaft-balancing machine).
- Holl, W.H. (USA): Design analysis of an automotive speed control system.

5. COMBINED MAN-MACHINE SYSTEMS

- Nalin, P., Raoult, J.C. (France): Modèles continus et échantillonnés de l'opérateur humain placé dans la boucle de commande. (Continuous and sampled models of the human operator included in the control loop).
- Bekey, G.A. (USA): Discrete models of the human operator in a control system.
- Wilcox, R.B. (USA): Dynamic analysis and simulation of management control functions.
- Tomović, R. (Yugoslavia): The role of automatic control in prosthetics.
- Young, L.R. (USA): A sampled-data model for eye-tracking movements.

6. APPLICATION TECHNIQUES

- Kochenburger, R.J. (USA): Self-adaptive method for accommodating large variations of plant gain in control systems.
- Oldenburger, R., Goodson, R.E. (USA): Hydraulic line dynamics.
- Anderson, B.C. (United Kingdom): The optimization of computer-controlled systems using partial knowledge of the output state.

7. AUTOMATIC CONTROL OF AEROSPACE SYSTEMS

- Tanner, J.A., Dietiker, W. (Canada): The design study of an adaptive pressure control system for a 5-foot by 5-foot blowdown wind tunnel.
- Pledier, G.J., Landy, J.J. (USA): Missile environment simulation for rocket engine test facility.

- Ellert, F.J., Merriam, C.W. (USA): A longitudinal guidance system for aircraft landing during flare-out.
- Taylor, F.J.D. (United Kingdom): Automatic control of a large steerable aerial for satellite communications.
- Wheeler, R.G. (United Kingdom): Design study of control system for 210-foot radio-telescope.
- Roberson, R.E. (USA): Dynamical model for fine pointing attitude control of the orbiting astronomical observatory.
- Cannon, R.H. (USA): Basic response relations for attitude control using gyros.

PART III: C O M P O N E N T S

1. MECHANICAL, HYDRAULIC AND PNEUMATIC COMPONENTS

- Oshima, Y., Araki, K. (Japan): A hydraulic torque amplifier.
- Newton, G.C. (USA): A rotary-drive vibrator-output gyroscopic instrument.
- Khoklov, V. (USSR): Some dynamic problems for a hydraulic actuator with inertial load.
- Gal, A.A. (USSR): Realisation of sequential machines by pneumo-automation means.

2. ELECTROMECHANICAL COMPONENTS AND MAGNETIC AMPLIFIERS

- Masslaroff, I.A. (Bulgaria): Two-position functional frequency device for automatic control.
- Benedikt, O. (Hungary): The problems, working methods and computation of a new component of control loops.
- West, J.C. (United Kingdom): The control of a linear electromagnetic oscillator.
- Vasiliev, Iu. K., Prokofiev, Iu.A., Vainberger, G.Ia. (USSR): Step motors with active rotors.

3. ELECTRONIC COMPONENTS

- Haskovec, J.S., Klimek, A. (Czechoslovakia): Some new control circuits with semi-conductor four-layer triodes PNPN.
- Storm, H.F. (USA): Turn-off silicon controlled rectifiers.
- Kaufman, A.B. (USA): Ceramic memories in extreme environments.

4. DIGITAL DEVICES

- Reeburger, H. (Austria): The use of digital integrating computers for automatic control.
- Fritzsche, W. (Germany): Advantages of and limitations to digital speed controlling devices.
- Aleksandridi, T.M., Diligenski, S.N., Krug, E.K. (USSR): Digital controllers.

THE INTERNATIONAL FEDERATION OF AUTOMATIC CONTROL

IFAC

ON THE OCCASION OF ITS SECOND CONGRESS, HELD IN BASEL, WISHES

TO EXPRESS ITS DEEP-FELT THANKS TO ITS FIRST PRESIDENT 1957-1959 HAROLD CHESTNUT

FOR THE OUTSTANDING SERVICES RENDERED TO IT DURING THE FIRST TWO YEARS OF ITS EXISTENCE.

THE FEDERATION HEREWITH PRESENTS HIM WITH A HAND-PAINTED PORCELAIN PLATE IN RECOGNITION OF HIS WORK AND AS A TOKEN OF GRATITUDE

BASEL, AUGUST 28th, 1963

THE PRESIDENT OF IFAC

Harold Chestnut

THE SECRETARY OF IFAC

Nickel Conrad

LA FÉDÉRATION INTERNATIONALE POUR L'AUTOMATIQUE

IFAC

REMERCIER LE

PROF VICTOR BROIDA ENTEUR HONORAIRE DE L'IFAC

DE LA PART ESSENTIELLE QU'IL A PRISE AVANT ET APRES SA FONDATION A PARIS LE 11 SEPTEMBRE 1957 ET DU TRÈS GRAND ET VALABLE TRAVAIL QU'IL A FOURNI COMME EDITEUR DU BULLETIN DE L'IFAC ET DES ACTES DU CONGRES IFAC 1963. EN TÉMOIGNAGE DE RECONNAISSANCE ILLA (U) OFFRE UNE ASSIETTE DE PORCELAINE PEINTE A LA MAIN

BASEL, LE 28 AOÛT 1963

LE PRÉSIDENT DE L'IFAC

Harold Chestnut

LE TRÉSOSIER DE L'IFAC

Nickel Conrad

МЕЖДУНАРОДНАЯ ФЕДЕРАЦИЯ АВТОМАТИЧНОГО УПРАВЛЕНИЯ

МФАУ

ПО СЛУЧАЮ ЕГО ВТОРОГО СЪЕЗДА В Г. БАЗЕЛЕ ЖЕЛАЕТ ВЫРАЗИТЬ

ПРОФЕССОРУ А. М. ЛЕТОВУ

ВТОРОМУ ПРЕДСЕДАТЕЛЮ МФАУ (1957 - 1959)

ЗА БЛАГОУТВЕРЖЕННУЮ ДЕЯТЕЛЬНОСТЬ ЗА ПЕРВОСЛУЖИЮ ОРГАНИЗАЦИЮ ПЕРВОГО СЪЕЗДА В 1960 Г. СОЮЗ ЖАЛИТЕ ЕМУ СЕМ РУКОПИСНУЮ ФАРФОРОВУЮ ТАРЕЛКУ В ЗАК ПРИЗНАНИЯ ЕГО РАБОТЫ И СВОЕЙ ИСКРЕННЕЙ ЕЛГОДАРННОСТИ

Г. БАЗЕЛЬ, 28-го АВГУСТА 1963 ГОДА

ПРЕСИДЕНТА МФАУ

Harold Chestnut

КАНАДИСКИЙ ЧЛЕН

THE INTERNATIONAL FEDERATION OF AUTOMATIC CONTROL

IFAC

SPRICHT BEI ANLASS IHRES 2. KONGRESSSES, ABGEHALTEN IN BASEL.

IHRER «HONORARY SECRETARY» HERRN DR. GERHARD RUPPEL.

IHREN HERZLICHEN DANK AUS FÜR DIE AUSGEZEICHNETEN UND UBERMÜDLICHEN DIENSTE, DIE ER SEIT DEREN GRÜNDUNG GELEISTET HAT. SIE ÜBERRECHT IHM NIEMIT ALS EIN ZEICHEN IHRER ANERKENNUNG EINEN HANDGEMALTEN PORZELLANTELLER

BASEL, DEN 28. AUGUST 1963

DER 1. PRÄSIDENT DER IFAC

Harold Chestnut

DER 2. KANZLEIERS DER IFAC

Nickel Conrad

5. CONTROL AND PROCESS INVESTIGATION INSTRUMENTATION

- Kryze, J. (Czechoslovakia): A universal statistical analyzer.
- Douce, J.L. (United Kingdom): The behaviour of adaptive controllers.
- Uskov, A.S., Orlov, Iu.M. (USSR): Design principles and circuit of a multichannel correlator. A specialized analogue computer for the statistical processing of random time series in industrial control systems.

6. COMPONENT RELIABILITY

- Garnjost, K.D., Thayer, W.J. (USA): New servo-valves for redundant electro-hydraulic control.
- Dummer, G.W.A. (United Kingdom): The reliability of electronic components.
- Sotskov, B.S., Dekabrun, I.E., Kriivorotova, L.S. (USSR): Reliability problems of electromechanical elements.
- Lawrence, I.A.J., Scotcher, R.J. (United Kingdom): A study of servomechanism reliability in nuclear reactor and plant control systems.

General Assembly of IFAC

The General Assembly of IFAC met, on the occasion of the Congress at Basle, on August 31st, 1963.

Since the General Assembly at Moscow in 1960, on the occasion of the First IFAC Congress, no General Assembly of IFAC has been held and, according to the Constitution, major decisions were therefore reached by means of postal ballots.

At the General Assembly in Moscow in 1960, the membership of IFAC - which previously included 23 National Member Organizations - increased to 26 by the admission of scientific organizations from Argentina, Bulgaria and Canada.

Since then, two successive postal ballots have allowed to admit in IFAC, on March 4, 1963, its 27th member, namely an organization of the United Arab Republic and, quite recently, its 28th member, namely an organization of the Republic of South Africa. These new memberships were reported to the General Assembly held in Basle.

The General Assembly heard and approved the President's and the Treasurer's reports and made some decisions amongst which the most important one is the fixation of the Third IFAC Congress of Automatic Control in London, from June 20th to June 26th, 1966.

The General Assembly then proceeded to the election of the new President and of the members of the IFAC Executive Council. Taking into account that half of its Ordinary Members and the Treasurer remain in office and that its non-voting officers are re-appointed, the new composition of the IFAC Executive Council is as follows:

- President: Mr. J.P. Coales (United Kingdom)
- Past President: Prof. Ed. Gercke (Switzerland)
- 1st Vice-President: Prof. P.J. Nowacki (Poland)
- 2nd Vice-President: Prof. K. Kaneshige (Japan)
- Treasurer: Dr. M. Cunenod (Switzerland)
- Ordinary Members:
 - Dr. J. Benes (Czechoslovakia)
 - Prof. J.C. Gillet (France)
 - Mr. J. Lozier (USA)
 - Acad. G.C. Moisil (Rumania)
 - Acad. V.A. Frapeznikov (USSR)
 - Prof. C.J.D.M. Verhaegen (Netherlands)
 - Honorary Secretary: Dr. G. Ruppel (Germany)
 - Honorary Editor: Prof. V. Broida (France)
- Non-voting Officers:

Meetings of the Executive Council

On the occasion of the Congress, the IFAC Executive Council met in Basle twice - on August 27th and 31st - before the General Assembly, in its former composition, and for a third time - on September 5th - after the General Assembly, in its new composition.

Committee Chairmen

The Executive Council adopted, amongst other actions, the general principle that all IFAC Committees Chairman and Vice-Chairmen (including those of the Advisory Committee, of the six Technical Committees and of the Publications Committee) should be replaced at each Congress.

In application of this principle, all former IFAC Committee Chairmen and Vice-Chairmen, appointed by the Executive Council in the course of its meeting on the occasion of the First IFAC Congress in Moscow in 1960, have been replaced in the course of its meeting of September 5th, 1963 at Basle. The only exception to the application of this very general rule was made for three Committee Chairmen and Vice-Chairman, because these were not appointed 1960 at Moscow but at a later date, replacing other Chairmen who either, unfortunately, had deceased (in one instance) or who had resigned (in the two remaining instances).

We list hereafter the names and addresses of all IFAC Committee Chairmen appointed (or formally confirmed in their previous provisional duties, in three particular instances) by the Executive Council in the course of its meeting on September 5th, 1963. In order to ensure the necessary continuity of action, it was, however, decided that these nominations become effective on January 1st, 1964 and that, until this date, there should be a period of transition with the former Chairmen and Vice-Chairmen of the corresponding IFAC Committees still in office. The new chairmen of the IFAC Committees are as follows:

LIST OF CHAIRMEN AND VICE-CHAIRMEN OF IFAC COMMITTEES

1. A d v i s o r y C o m m i t t e e
 Chairman: Mr. Harold Chestnut, c/o General Electric Co., Building 37-575, One River Road, Schenectady, N.Y., USA
 Vice-Chairman: Prof. A.M. Letov, c/o Institut Avtomatika i Telemekhanika, Kalanchevskaja ul. 15a, Moscow I-53, USSR
2. T e c h n i c a l C o m m i t t e e o n A p p l i c a t i o n s
 Chairman: Mr. W.E. Miller, Metal Rolling Application Engineering, General Electric Co., One River Road, Schenectady, N.Y., USA
 Vice-Chairman: Mr. U.A. Luoto, c/o Ekono, E. Esplanadi 14, Helsinki, Finland
3. T e c h n i c a l C o m m i t t e e o n B i b l i o g r a p h y
 Chairman: Prof. Dr. Ing. V. Broida, 13 rue de la France-Mutualiste, Boulogne-sur-Seine, France
 Vice-Chairman: Dr.-Ing. N. Naplatanoff, Iskar no. 3, Sofia, Bulgaria
4. T e c h n i c a l C o m m i t t e e o n C o m p o n e n t s
 Chairman: Prof. Dr. B.S. Sotkov, c/o Institut Avtomatika i Telemekhanika, Kalanchevskaja ul. 15a, Moscow I-53, USSR
 Vice-Chairman: Mr. S.S. Carlsle, 156 Lower Road, Great Bookham, Surrey, United Kingdom
5. T e c h n i c a l C o m m i t t e e o n E d u c a t i o n
 Chairman: Prof. W. F. in des sen, Katedra Automatyki i Telemekhaniki, Politechniki Warszawskiej, ul. Koszykowa 75, Warszawa, Poland
 Vice-Chairman: Prof. J. La Gasse, Laboratoire du Génie Electrique, 2 rue Camichel, Toulouse, France

6. P u b l i c a t i o n s C o m m i t t e e
 Chairman: Dr. B.N. Nurov, c/o Institut Avtomatika i Telemekhanika, Kalanchevskaja ul. 15a, Moscow I-53, USSR
 Vice-Chairman: Mr. Derek Barlow, 76 Cheyne Court, London SW 3, United Kingdom
7. T e c h n i c a l C o m m i t t e e o n T e r m i n o l o g y
 Chairman: Dr. H.L. Mason, 7008 Meadow Lane, Chevy Chase 15, Maryland, USA
 Vice-Chairman: Prof. C. Penescu, Calea Victoriei 120, Bucuresti 22, Rumania
8. T e c h n i c a l C o m m i t t e e o n T h e o r y
 Chairman: Prof. J. Truxal, Department of Electrical Engineering, Brooklyn Polytechnic Institute, 333 Jay Street, Brooklyn 1, N.Y., USA
 Vice-Chairman: Prof. J.H. Westcott, Imperial College, Department of Electrical Engineering, Exhibition Road, London SW 7, United Kingdom
 Prof. Dr. A.A. Voronov, c/o Institut Elektromekhaniki, Dvortsovaia naberejnaja 18, Leningrad, USSR

F U T U R E S Y M P O S I A

Amongst other business, the Executive Council considered the various proposed symposia to be organized or sponsored by IFAC in 1964 or early in 1965, in co-operation with or on request of the corresponding IFAC National Member Organizations. These matters were first submitted by the Executive Council for comments to the appreciation of the corresponding IFAC Technical Committees (on Theory, on Applications or on Components) who, in turn, gave their recommendations to the Advisory Committee. The latter reported back to the Executive Council which took the necessary final action.

Although nothing definite can be stated as yet and although further steps have still to be taken as far as some National Member Organizations of IFAC or other Federations are concerned, the following symposia can be tentatively visualized at the issue of the Executive Council meetings in Basle:

- a) S y m p o s i a in the field of T h e o r y
 a symposium on sensitivity analysis of nonlinear systems to be organized, from August 30th to September 5th, 1964 at Dubrovnik, Yugoslavia, by the Yugoslav Committee for Electronics and Automation,

a symposium on hazard and race phenomena in switching circuits to be organized, from October 6th to October 13th, 1964 at Bucarest, Rumania, by the Rumanian National Member Organization,

b) Symposium in the fields of Theory and Applications a symposium on systems engineering for control systems design, probably in November 1964 or spring 1965 in Tokyo, Japan,

a symposium on automatic control in the peaceful uses of space, probably late in 1964 or early in 1965,

c) Symposium in the field of Applications a symposium on automatic control and programming in mechanical production to be organized by I.B.R.A. (Institut Belge de Regulation et d'Automatisme) in Brussels, Belgium, from May 25th to 29th, 1964,

a joint IFAC-IFIP symposium on digital process control is also visualized for September 1964.

d) Symposium in the field of Components a joint IFAC-IMEKO symposium on component parameters and characteristics for automatic control use is visualized for September 1964 in Stockholm, Sweden.

This tentative list of symposia is subject to confirmation in a forthcoming number of the IFAC Bulletin which will give further relevant details.

Moreover, the Executive Council has instructed the Technical Committees to consider proposals for 9 more symposia to be held later in 1965 and to report on this topic at the next meeting of the Executive Council which will be held in Warsaw, Poland, sometime between the 10th and 18th June, 1964.

We could not conclude this report on the Congress, the General Assembly and the meetings of the Executive Council of IFAC in Basle better than by quoting part of the paper published by Professor Ed. Gerocke, Past President of IFAC, President of the Swiss Federation of Automatic Control, in the November 1963 issue of the Zurich magazine "Neue Technik" under the title

THOUGHTS ON THE IFAC CONGRESS, BASLE, 1963

1) Survey Sessions

It was gratifying to see that at each of the 11 survey sessions always more than 1,000 delegates were present. The new idea of such survey sessions had been suggested by the President of the Swiss Federation of Automatic Control to the Executive Council of IFAC in May 1962. These survey sessions were interesting

above all because they gave the international state of art of the theory and practice of automatic control and illustrated their future trends. They met the needs of the delegates to be informed in a comprehensible way on the allied fields, in which they were not engaged themselves. The delegates very much appreciated the fact that the English version of survey papers was available to them, shortly before the meeting, in the form of photostatic copies.

2. Discussion sessions

The major part of time was devoted to the discussion of the 159 papers, preprints of which were supplied to the delegates four weeks before the Congress for study and preparation of discussions. Discussion papers had to reach IFAC by September 1st, 1962. Their selection was made at the end of November by the President of the Paper Selection Committee, suggested by the Executive Council of IFAC in 1961. This Committee selected 159 from the 260 submitted papers and fixed the schedule of the various sessions, a task which should be given even more careful consideration for the next Congress.

About half of the discussion papers dealt with advanced theory, the remainder being left for Applications and Components. The theory of automatic control is already very advanced and requires a good knowledge of mathematics. Probably there exists some gap between theory and its applications. But all the practical objects and procedures we know today were once "in the clouds". It is one of the main aims of IFAC Congresses to bridge this gap and to find useful applications for theory. During the recent years, most interesting and elegant solutions of problems in the field of advanced automatic control were found. But, unfortunately, very often neither an application could be quoted nor the hardware allowing the practical embodiment of the mathematical solutions was available.

The total attendance of the 50 discussion sessions (7840 delegates) corresponded, taken by fields, to the following figures:

- Theory: 3,920 delegates (for 25 sessions)
- Applications: 2,700 delegates (for 19 sessions)
- Components: 1,220 delegates (for 6 sessions)

The average number of delegates per session was therefore 156 for Theory, 142 for Applications and 200 for Components, with a total average of 157. There were, as an average, only 654 delegates present at discussion sessions, i.e. 44% of those registered. More than 300 delegates took part in each of the following sessions: Systems Dynamics, Nonlinear Systems with Random Parameters, Nonlinear Stochastic Systems, Learning Systems, Steel Industry, Man and Machine, Digital Devices. Less than 80 attended each of the sessions on the following topics, in which obviously only a small number of specialists are engaged: Discrete Systems, Optimal Systems with Distributed Parameters, Optimal Programming, Hydro-System Control, Automated Industry, Aerospace Systems. It is to be considered whether such topics should not rather be discussed by specialists in seminars.

3. The aims of Congress delegates We should discuss now how Congresses should be made more attractive and more effective. Several categories of delegates should be considered. For the first, to which belong delegates not actively engaged in the field and simply requiring general information, a well-presented lecture is more effective than the study of the report published later. For the category of delegates survey papers are most important.

The second category is that of delegates actively engaged in the very field and requiring to learn of where their specialist topic presently stands and who is actively engaged in it. They not only appreciate survey sessions but also take an active part in discussions, they are interested to know the individuals, universities and industries active in their field and they search the opportunity of personal contacts. In favourable instances, an international team may result from the latter. For these "active" delegates it is moreover interesting to know what new methods are being adopted in allied fields in order to consider the possibility of applying them in their own area of activity.

A further category of delegates wishes to be acquainted with the development trends of particular fields, so as to be able to introduce in turn younger people in universities or in industry to the topic.

Congresses give also the opportunity for mutual contacts of advanced research workers and with the younger generation. Many questions which are not raised in lecture rooms are discussed in small groups in all details, and this sometimes results in lifetime friendships. In this respect, Congresses are invaluable. Moreover, they stimulate those engaged in research, especially the younger ones, to contribute studies of particular value which otherwise would have remained incomplete and unpublished.

In the Executive Council of IFAC, the question was raised how to select topics for the next Congress. In Basle, industry was not as well represented as it had been expected. The attempt will have to be made to lay more stress on practical problems and, if possible, to include operational aspects. On the other hand, problems dealing with more practical aspects are handled in detail at meetings of the national member organizations of IFAC, as well as at Congresses connected with large exhibitions such as "Interkama" (Düsseldorf), "Mesuroca" (Paris), "IEA" (London) and "INTEL" (Basle). IFAC Congresses will therefore have to be planned above all for dissemination at all levels of the advanced theory of automatic control.

4. Symposia The development of automatic control requires cooperation between experts in their restricted fields. The Executive Council of IFAC has therefore planned Symposia for specialists to be held between IFAC Congresses. To these a limited number of experts will be invited personally.

5. Congress Lectures The question may be raised whether the general need for an increase of knowledge of a particular topic can be satisfied by lectures or courses during Congresses. It is not possible for everybody to become familiar with a new subject by the study of periodicals or books. If, however, an outstanding personality lectured on the fundamental issues of a topic, this experience would be remembered and would serve as a stimulus for further studies. It is quite possible that such lectures on fundamental issues given by outstanding people would be just as well attended as were survey sessions. This would then be a sort of "travelling university" and the Congress would give the opportunity of attending a series of most modern lectures, clearly based on pedagogical lines and presented by leading authorities in the field.

6. Courses outside of Congresses Many participants could not follow to the desirable extent lectures and discussions through lack of sufficient knowledge in mathematics, Automatic control covers a very broad field, as e.g. technology, physics, electronics and advanced mathematics which are all rapidly developing. Therefore, the education of young control engineers in technical universities should follow these trends by means of new courses. Furthermore, engineers already working in industry should have the possibility of systematically attending courses in the new fields, given in universities during e.g. one or two weeks, the necessary time being granted by their firms. The scientific knowledge of many practical engineers should be increased, so that they could better follow papers read in Congresses.

7. Acknowledgements The organization of a large Congress requires the cooperation of many devoted persons. A large part of this work is benevolent and done by people who find time for the interests of IFAC in spite of the requirements of their own profession. To all of these we extend our hearty thanks, especially to the indefatigable and extremely conscientious Honorary Secretary of IFAC, Dr. Gerhard Ruppel, to the Honorary Editor of IFAC, Professor Dr. V. B. Brodskiy, and Professor O. Pochner (Aachen), to the Selection Committee of IFAC, the committee members of the Swiss Federation of Automatic Con-

trol and the leaders of the various sub-committees, specially to Dipl.-Ing. Ernst R u o s c h, who led the work of the 16 scientific secretaries. Our thanks are also due to Dr. H.P. R s c h u n d i, Federal Councilor, and to Dr. Ed. W y s s, State Councilor, Basle-Town, for their speeches at the opening session. Especial thanks are due to Dr. A. S c h a l l e r, State Councilor, Basle, President of the Swiss Industries Fair, and to Dr. H. H a u s w i r t h, Director of the latter, to its Vice-Directors, Mr. G. K i n d h a u s e r and Dr. E.M. B a m a t t e r, to its Press Service, to many other members of their staff and to Mr. Fred A m m a n n, publisher of "Neue Technik". Very special thanks must be expressed to Dr. Anton von S c h u l t h e s s, the Congress Secretary, who carried out his difficult task with great understanding of its overall aspects.

The Congress would not have been possible without the financial support of the Swiss Federation, the Canton Basle-Town, the Swiss Institute of Technology, the Swiss Industries Fair and the INEL Exhibition as well as of many Swiss industrial firms. We extend to them all our most hearty thanks.

IFAC SYMPOSIUM on OPTIMIZING and ADAPTIVE CONTROL

The Proceedings of this Symposium which had been organized in Rome 1962 by the IFAC Theory Committee in collaboration with Commissione Italiana per l'automazione have now been published and may be ordered from the Instrument Society of America, Penn-Sheraton Hotel, 530 William Penn Pl., Pittsburgh 19, Pa., USA. The editor of the Proceedings is Mr. Emil J. M i n n a r.

The work includes all papers read at the Symposium. The price of the Proceedings including mailing cost is \$ 10.50 for the USA, \$ 12.00 for other countries. IFAC is much indebted to the Instrument Society of America for having undertaken this publication at a rather moderate price.

NEWS FROM NATIONAL MEMBERS

France

In response to a general appeal of the IFAC Executive Council to all National Member Organizations, asking them to increase their respective annual subscriptions, A.F.R.A. (Association Française de Régulation et d'Automatisme), National Member Organization of IFAC for France, has decided to double its annual subscription and to increase it therefore from \$ 250 to \$ 500 per annum.

This decision, for which IFAC is most grateful to A.F.R.A., deserves a special mention in the present Bulletin with the hope that other countries will follow the example of the French National Member Organization of IFAC.

Republic of South Africa

The composition of the S.A.C.A.C. (South African Council for Automation and Computation), National Member of IFAC for the Republic of South Africa, was in the year ending 31st August 1963 as follows:

(The names of officers and members of the Executive Council are marked with an *)

- President Dr. O. B r u n e *
- Vice-President Mr. A.A. M i d d l e c o t e *
- Treasurer Dr. G.P.R. v o n W i l l i c h *
- Secretary Mr. J.D.N. v a n W y k *

M e m b e r s

- | | |
|--------------------------------|--------------------------------------------------------------|
| Prof. G.R. Bozzoli | r e p r e s e n t i n g |
| Mr. L.G. Axe | South African Institute of Electrical Engineers |
| Dr. G.P.R. von Willich * | South African Institute of Civil Engineers |
| Mr. J.P. Kriel | |
| Mr. G.J. Kallis * | South African Institute of Mechanical Engineers |
| Dr. W.A. Woerber | Engineers |
| Mr. A.M. Patterson (Alternate) | |
| Mr. R.P. Hacking (Alternate) | |
| Mr. A.A. Middlecote * | South African Bureau of Standards |
| Mr. A. Mehl | |
| Dr. A.P. Burger | South African Council for Scientific and Industrial Research |
| Mr. J.D.N. van Wyk * | |
| Mr. J. Curtis | Institution of Production Engineers |
| Mr. J. Astrup | |

- Mr. S. Bishop * Instrument and Control Society of Southern Africa
 - Mr. J.H.A. Lever
 - Mr. G.A. Harvey
 - Mr. J.H. Smith Electricity Supply Commission
 - Mr. J.A. Bothma
 - Dr. W. de Villiers Anglo-American Corporation of S.A. Limited
 - Mr. D.M. Bentley
 - Mr. D.E. Nevin Anglo-Transvaal Consolidated Investment Co.
 - Mr. G.P. Bennett
 - Mr. W.F. Thomas (Alternate)
 - Mr. R.D. Green (Alternate)
 - Mr. R.A. Plumbidge Gold Fields of South Africa Limited
 - Mr. P.W.J. van Rensburg
 - Prof. W.E. Phillips University of Natal
 - Mr. T.N.E. Skinner
 - Mr. C.L. Olen University of Stellenbosch
 - Prof. S.R.F. Goidner
 - Dr. D.S. Henderson University of Witwatersrand
 - Mr. T.O.D. Duggan
 - Mr. G. Korvink (Alternate) Rhodes University
 - Prof. J. Irving
 - Prof. R.N. Braae
- A f f i l i a t e r e p r e s e n t i n g M e m b e r s**
- Mr. D.E. Raubenheimer Elliott Automation (Pty) Ltd.
 - Mr. T. Weicker * International Business Machines S.A. (Pty) Ltd.
 - Mr. G.G. Goad International Computers and Tabulators S.A. (Pty) Ltd.
 - Mr. L. Fantl Leo Computer Services (Pty) Ltd.
 - Mr. N.P.D. Sadie (Alternate)
 - Mr. N.S. Woolf South African Phillips (Pty) Ltd.
 - Mr. J.J. Grobler Standard Telephone and Cables (S.A.) (Pty) Ltd.
 - Mr. R. Gout Western Industries (Pty) Ltd.
- The members of the Executive Committee were:
- Dr. O. Bruner, President,
 - Mr. A.A. Middlete, Vice-President.
- Electd: Mr. S. Bishop, Mr. C.J. Rallis, Mr. J.D.N. van Wyk, Dr. G.P.R. von Willlich, Mr. T. Weicker.

S y m p o s i u m

The Symposium Sub-Committee was active in obtaining contributions to the First Symposium on Automation and Computation to be held in South Africa. In a fund raising campaign to finance the publication of the Proceedings of the Symposium, it has received most generous and welcome support. As a result of these efforts and meticulous attention to other details of organization, S.A.C.A.C. trusts that this Symposium will further stimulate its growth by engendering faith in its effectiveness as an organisation.

M i s c e l l a n e o u s

S.A.C.A.C. was happy to be able to give financial support to the Engineering Faculty of the Witwatersrand University for the purpose of bringing Dr. Rufus Oldenburg, Purdue University, Lafayette, Indiana, USA, to give a series of lectures at its Winter School on Automatic Control.

For the future the two following objects were suggested for S.A.C.A.C.:

1. to promote gatherings like the pending symposium, on a national basis at regular intervals,
2. to send a South African delegation to the next International Congress of IFAC to be held in 1966 in London.

United Kingdom

The Third Annual General Meeting of the British Conference on Automation and Computation (B.C.A.C.), now renamed the United Kingdom Automation Council (U.K.A.C.), was held on Wednesday, 9th October, 1963.

The change of name to "United Kingdom Automation Council" was recommended because the use of the designation "Conference" in the former title had given rise to misunderstanding as to the organization's continuing character; in suitable contexts the short title "The Automation Council" could be used. The change reflects a growing usage by which the term Automation comprises computation in its scope.

The meeting elected the Honorary Officers and Executive Committee for the ensuing year, as follows:

- H o n o r a r y O f f i c e r s**
- Chairman Mr. J.R. Coales
- Vice-Chairmen Prof. G.D.S. MacLellan
- Mr. C. Mead
- Sir Steward Mitchell
- M. Derek Dunpre
- Honorary Treasurer Mr. F. Jervis Smith
- Honorary Secretary

Executive Committee

Mr. E.C. Clear Hill	Prof. S.C. Redshaw
Mr. S.S. Carlisle	Dr. J.M.S. Risk
Mr. J. Cooper	Mr. S.M. Rix
Mr. W.M. Larke	Mr. A. St. Johnston
Sir Charles Norriss	Mr. G.M.E. Williams
Sir Walter Puckey	Mr. W.F.S. Woodford

USA

American Automatic Control Council

Membership

The American Institute for Aeronautics and Astronautics (AIAA) has joined the American Automatic Control Council. This raises to five the number of member societies in AACOC. The other four societies are the Institute of Electrical and Electronics Engineers (IEEE), the Instrument Society of America (ISA), the American Society of Mechanical Engineers (ASME), and the American Institute of Chemical Engineers (AIChE).

AIAA was formed last year as the result of the merger of the American Rocket Society (ARS) and of the Institute of Aeronautical Science (IAS).

New AACOC Officers for 1964-65

President: Professor John E. Ward
 Room 32-101, Massachusetts Institute of Technology,
 Cambridge 39, Mass.

Vice-President: Dr. Theodore J. Williams
 R and E Division, Monsanto Chemical Company,
 800 N. Lindbergh Blvd., St. Louis 66, Mo.

Professor Gerald Weiss is continuing as secretary - treasurer.

New AACOC Technical Committee Chairmen

Theory Committee: Prof. John E. Gibson (Purdue University, Lafayette, Indiana).

Applications Committee: Dr. Theodore J. Williams (Monsanto Chemical, St. Louis, Mo.).

Education Committee: Prof. George C. Newton, Jr. (MIT, Cambridge, Mass.).

Components Committee: Prof. Herman R. Weed (Ohio State University, Columbus 10, Ohio).

New Standing Committees

The Council has established two new standing committees. The committee chairmen are:

Automation: Eugene W. Grabbe (TRW, Inc., Canoga Park, Calif.)

Planning: John Salzer

International

INTERNATIONAL COMPUTATION CENTRE, Rome

ICCC Structure

The International Computation Centre, an intergovernmental organization which has at the present time 12 member states: Argentina, Belgium, Cuba, France, Ghana, Greece, Israel, Italy, Japan, Libya, Mexico, United Arab Republic, is comprised of the following organs:

1. The General Assembly which consists of one representative of each member state and a representative of UNESCO. It is the supreme organ of the Centre.

2. The Executive Council consisting of six persons elected by the General Assembly from candidates presented by member states, and of the representative of UNESCO. The present members are:

Chairman: Prof. P. A. Unger (France)

Vice-Chairman: Prof. A. Ghizzetti (Italy)

Members: Mr. A. Gerz (Israel), Dr. H. Husain (U.A.R.), Mr. A. Perez-Villoria (UNESCO), Prof. A. Sadokky (Argentina), Prof. H. Yamashita (Japan).

3. The Director and a scientific and administrative staff. The present Director, Mr. Stig Comét, heads a scientific and administrative staff composed of nine persons.

Work in progress

In March 1962 the International Federation for Information Processing (IFIP) requested the International Computation Centre to collaborate with them in the field of Terminology, and the IFIP-ICCC Joint Terminology Committee was created.

In the past, the objective of Terminology work in a particular speciality has been to define usage and to compare and contrast it in different languages. The approach of the Joint Committee, however, is novel. Attention is concentrated on concepts rather than on the terms which are used to denote them in any particular language. The Committee writes definitions of concepts, for which a term is needed in all languages.

It is intended that these agreed definitions be submitted to sub-committees, each one dealing with a different language and made up of native users of that language, experts in Automatic Data Processing. Each sub-committee will then be able to identify the terms in its own language which are appropriate for the concepts, the definitions of which the sub-committee is not

permitted to change. There will thus result from this work a vocabulary of equivalent terms in different languages, the equivalence between all terms being precise, and not dependent on context, as is the case with normal translations of terms. Because the subject itself is relatively new, this approach has a good chance of success: the jargon is not yet so firmly established that it is unsusceptible of the slight modifications necessary for international standardization. Needless to say, to make this process possible the definitions must be of very high quality, and although the Joint Committee has already devoted a great deal of time and effort to writing them, it is not expected that a satisfactory set (of about 1,000 definitions, originally in English) will be ready before the end of 1963.

A.I.C.A. - International Association for Analogue Computing

The fourth International Conference of the International Association for Analogue Computing (Association Internationale pour le Calcul Analogique, A.I.C.A.) will be held at the College of Technology, Moulsecomb 7, Brighton, England, on the 14th - 18th September, 1964. It is organized by the British Computer Society and A.I.C.A. under the aegis of the United Kingdom Automation Council. The Conference languages are English and French.

Anyone wishing to submit a paper should initially send in a summary only, but in detail sufficient to allow the referees to judge the potential scope of the paper. A selection will be made from the summaries and the authors concerned will be invited to submit their papers in full. Summaries may be offered in any language, but where this differs from the official conference languages, authors are asked to include a version of their summary in either of the official languages, preferably in English. The selection of papers will be the responsibility of A.I.C.A., in collaboration with the B.C.S. and U.K.A.C.

Summaries and all correspondence relating to the submission of papers should be addressed to: Professor S.C. Redshaw, Vice-President A.I.C.A., Department of Civil Engineering, The University, Birmingham 15, England. The registration fee for the conference will be £5 (five pounds sterling) - (£4.10s.0d. to members of A.I.C.A. or the B.C.S. or other member societies of U.K.A.C.). Registration forms may be obtained from the Honorary Secretariat, and in order that the booking of hotel rooms may be completed in good time, intending participants are asked to register not later than 30th April, 1963, and if possible by the end of 1963. Late registrations will be accepted, but the later they are received, the more difficult will be reservation of

suitable hotel rooms. Intending participants who have not registered by 30th April 1964 are asked to notify the Secretariat of the possibility of their registering later: The B.C.S./A.I.C.A. Honorary Secretariat, Ferranti Limited, Kern House, 96 Kingsway, London W.C.2, England.

Austria

The O.A.A. (Österreichischer Arbeitsausschuss für Automatisierung - Austrian Working Committee on Automation) has organized the following lectures, courses and technical visits in 1963:

Febr. 28 - "The use of semiconductors for control problems in electric power techniques" by R. Lappe, Dresden (Germany)

March 6 and Apr. 17 - "Technical visits to a Computation Centre in Vienna"

March 19, 21, 26, - "Courses on electronic components (transistors)" by H. Eichler, Vienna
20; April 23, 25, 30; May 2

March 28 - "New forms of pressure and temperature control in very high-pressure steam plants" by W. Janowski, Essen (Germany)

April 2, 3, 4, 18 - "Visits to an educational exhibition of pneumatic control devices"

April 18 - "Social and economical problems of automation" by H. Tagwerker, Vienna

May 20, 21, 27 - "Courses on linear programming" by W. Ebnerl, Vienna

June 6 and 7 - "Introduction of semiconductor amplification techniques in heating and chemical process control" by J. Wetzer, Berlin

Sept. 24 and 25 - "Seminar on machine-tool control" with the following lectures:

- "Special problems of lathe operation programming" by E. Kunst, Vienna
- "Electro-hydraulic control of turret and automatic lathes" by E. Dözekal, Langen (Germany)
- "Useful controls for automatic operation, especially on automatic lathes" by S. Fiedis, Linz

- "Automatic operation control of single- and multiple-spindle automatic machines" by G. Spurr, Bielefeld (Germany)
- "The road to automation" by S. Chwendemann, Gießen (Germany)
- "Measuring control of copying machines" by H. Schiemann, Schaffhausen (Switzerland)
- "Electrohydraulic control of machine-tools" by W. Schaller, Müritzen (Germany)
- "The introduction of horizontal boring with repetition control" by K. Jüstel, Rheyt (Germany)
- "Special machines and their control" by T. Stöhrle, Ludwigsburg (Germany)
- "Measuring control and copying in cylindrical grinding" by R. Barth, Stuttgart (Germany)
- "Control and supervision of industrial processes by means of control systems and process computers" by H. Kalketer, Karlsruhe (Germany)

Sept. 26

Belgium

International Seminar on Automatic Control and Programming in Mechanical Production

This seminar, organized by I.B.R.A. (Institut Belge de Régulation et d'Automatisme), IFAC National Member Organization for Belgium, has been already mentioned in the present Bulletin, page 22, amongst the symposia the organization or the sponsoring of which has been considered by the IFAC Executive Council in course of its meetings at Basle. It will take place at Brussels, Belgium, on May 25 to 29, 1964, and its programme is defined as follows:

The aim of the organizers is to bring together mechanical and control engineers of various countries in order to determine what automation can bring to mechanical production. They expect that mechanical engineers will make use of their knowledge of industrial problems and that control engineers will mention the latest means provided by Automatic Control to those who are concerned with a continuous improvement of productivity and of quality.

Only papers bridging mechanical engineering and control engineering will be accepted for presentation, whether they define what are the process requirements for automatic control or what are the improvements the latter can ensure to mechanical production and to its engineering and economical optimization.

Applications of automatic control to mechanical production will be considered in the broadest meanings of this field, such as:

- machine-tools used either for material-stripping (such as metal-cutting) or for shaping final products including automatic transfer lines,
- final product moulding (metals, plastics etc.),
- assembly and welding (mechanical, electro-chemical, coating etc.),
- finishing processes (mechanical, electro-chemical, coating materials handling).

Papers will cover improvements likely to be achieved in this field by automatic control techniques, such as:

- sensors, checking and sorting devices and methods including automatic product analysis instruments,
- controllers and switching systems,
- information processing by means of analogue and digital computers.

Lectures

The Royal Belgian Society of Electrical Engineers has organized the Royal Belgian Society of Electrical Engineers has organized the following lectures:

- Nov. 8, 1963 - "Automation of the Saint-Ouen power station" by J. Thore (France),
- Dec. 3, 1963 - "The start and the first operating results of digital information loggers at the Mol power station" by J. Jonaux and J. Rens.

On the other hand, I.B.R.A. has organized a cycle of lectures on automatic control of industrial processes with the following programme:

- Nov. 18, 1963 - "Mathematical models of industrial automatic control systems" by R. Perez,
 - Dec. 16, 1963 - "Optimal control problems" by J. Charles,
 - Jan. 20, 1964 - "Investigation of the static and dynamic behaviour of a tubular chemical reactor" by S. Wajc,
 - Febr. 17, 1964 - "Investigation of the automatic control of a tubular chemical reactor" by A.E. Fournier,
 - March 16, 1964 - "Space vehicle guidance problems" by P. Godfrin,
 - April 13, 1964 - "Investigation of the automatic control of space vehicles" by P. Vanremortel,
 - May 11, 1964 - "Optimal automatic control of large industrial complexes" by R. Vichnevsky.
- These lectures will take place on Mondays, at 5.30 p.m., at the Hotel Ravenstein, 3 rue Ravenstein, Brussels.

International Symposium on Analogue and Digital Techniques Applied to Aeronautics

We have given in our Bulletin no. 14 (pages 22 and 23) preliminary information on this symposium which has been organized since at Liège, Belgium, on September 9 to 12, 1963, by the International Association of Analogue Computation, the Belgian Institute of Automatic Control and other Belgian Societies. We are now in a position to quote some of the titles and authors of the 53 papers presented at this Symposium as far as their topics are closely affiliated to automatic control problems:

- "Methods of communication with digital computers and their applications for research and control" by H. Herman, n,
- "Stabilité d'un véhicule aérien en rotation de roulis" (Aircraft stability in rolling rotation) by F. O. U. r. q. u. e. t.,
- "The role of advanced hybrid computing systems in simulation studies of VFWOL aircraft" by W. A. H. a. v. r. a. n. e. k.,
- "Stabilitätsuntersuchungen an Fallschirmen mit Hilfe eines Digital- und Analogrechners" (Stability researches on parachutes by means of a digital-analogue computer) by R. L. U. d. w. i. g.,
- "Détermination algébrique des critères de stabilité pour un avion volant à grande vitesse et à haute altitude" (Stability criteria algebraic determination for an aircraft flying at high speed and high altitude) by J. R. a. y. b. a. u. d.,
- "Die Untersuchung des dynamischen Verhaltens des geregelten Schwebefluges bei VFWOL-Flugzeugen mit Hilfe von Analog- und Digital-Rechnern (Research of the dynamic behaviour of VFWOL-aircraft controlled hovering flight with the assistance of analogue and digital computers) by G. S. c. h. w. e. i. z. e. r.,
- "Nachbildung der Flugeigenschaften von Luftfahrzeugen am elektronischen Analogrechner und Prüfung der Eigenschaften von Autopilot-Systemen mit Hilfe eines durch den Analogrechner angesteuerten mechanischen Dreiaachsen-Simulators" (Representation of aircraft flight properties on an analogue computer and autopilot system properties investigation by means of a three-axis simulator controlled through the analogue computer) by W. B. u. b.,
- "Eine analytische Untersuchungsmethode für die Stabilität von geregelten und ungeredelten erdnahen Satelliten" (An analytical research method for the stability of controlled and uncontrolled earth-neighbouring satellites) by G. S. c. h. w. e. i. z. e. r.,
- "Über die Lösung von Optimalisierungsproblemen bei Raumflugbahnen Kleiner Schubschleimführung mit Hilfe des Analogrechners" (On the solution of optimizing problems with small thrustacceleration space flight trajectories by means of analogue computers) by H. Z. e. h. l. e. and W. G. i. l. l. o. i.

France

Centre de Perfectionnement Technique

The Centre de Perfectionnement Technique has organized the following lectures in Paris in 1963 on the general topic "Automatic Control in Nucleonics":

- May 14 - "The Control of the Chinon nuclear power stations" by F. a. y. s. and P. u. p. o. n. i.,
- May 21 - "Data processing at the Chinon Electricité de France No. 2 nuclear power station" by P. o. u. t. o. n. e. t. and M. o. r. i. n.,
- May 28 - "Data processing at the Chinon Electricité de France No. 3 nuclear power station" by G. r. ü. n. b. e. r. g. e. r. and M. o. r. i. n.,
- June 4 - "Automatic control in the supervision of nuclear reactors" by B. a. u. d. e.,
- June 11 - "New electronic techniques applied to the supervision of a reactor" by L. i. m. o. n. g. i.,
- June 18 - "Instrumentation and control in an irradiated fuel regeneration plant" by W. o. n. g. o. n.

Lectures on digital control

Five French industrial, scientific and professional bodies: Centre National d'Automatisme (CNA - National Automation Center)

- Association Française de Régulation et d'Automatisme (AFRA - French Association of Automatic Control) Radioléctriciens
- Société Française des Electroniciens et Radio Ingénieurs) (French Society of Electronic and Radio Engineers)
- Syndicat des Constructeurs Français de Machines-Outils (French Syndicate of Machine-Tool Manufacturers)
- Société des Ingénieurs de l'Automobile (Automobile Engineers Society)

have jointly organized the following cycle of lectures on digital control:

- May 29, 1963 - "Industrial applications of digital control. Present state and future prospects" by R. P. r. u. d. h. o. m. m. e.,
- Oct. 28, 1963 - "Discontinuous-positioning machines" by P. N. a. s. l. i. n.,
- Dec. 2, 1963 - "Continuous-positioning machines with separate computers" by J. P. o. n. t. e.,
- Dec. 16, 1963 - "Continuous-positioning machines with integrated or semi-integrated computers" by R. A. R. u. b. i. n. s. t. e. i. n.,
- Jan. 27, 1964 - "Continuous mass-production manufacturing processes" by P. J. a. r. e. l. t. o. n.,
- Feb. 24, 1964 - "Discontinuous mass-production manufacturing processes" by J. C. s. e. c. h.,
- March 17, 1964 - "Human aspects and economical consequences" by M. C. h. a. l. v. e. t.

All these lectures are given on Mondays at 6 p.m. in the Syn- dicate of Automobile Manufacturers, 2 rue de Presbourg, Paris (8).

Symposium on digital measuring techniques

The Joint Committee on Electrical and Thermal Measurements of the VDE and VDI has organized, on October 3 and 4, 1963, in Nürnberg a symposium on digital measuring techniques.

The 15 following papers - which will be published as VDI-Berichte (Report of the Verein Deutscher Ingenieure) No. 78 (approximately 110 pages, price: DM 40) - were read and discussed at this symposium:

- "Grenzen und Möglichkeiten der analogen und digitalen Technik" (Limits and possibilities of analogue and digital techniques) by A. Lehnerd,
- "Informationstheorie und digitale Messtechnik" (Information theory and digital measuring techniques) by V. Kusl,
- "Zahlensysteme, Codierung und Code-Sicherung in der digitalen Messtechnik" (Numerical systems, coding and correcting codes in digital measuring techniques) by E.R. Berger,
- "Elektrisches Speichern und Zählen" (Electric memories and counting) by A.H. Zschekel,
- "Digitales Messen von Integralwerten" (Digital measurement of integral values) by H.W. Weitzel,
- "Digitales Messen von Momentanwerten" (Digital measurement of instantaneous values) by A. Hücker,
- "Ausgabeverfahren" (Display methods) by W. Walter,
- "Digitale Zeit-, Frequenz- und Drehzahlmeßgeräte" (Digital time, frequency and angular speed measuring devices) by M. Klöse,
- Digitale Meßgeräte für elektrische Momentanwerte" (Digital measuring devices for electrical instantaneous values) by E. Unger,
- "Einrichtungen für die digitale Erfassung wärmetechnischer Meßgrößen" (Equipment for digital processing of thermal values) by Th. Ankel,
- "Digitale Meßgeräte zur Erfassung mechanischer Größen" (Digital measuring devices for processing mechanical values) by W. Pabst,
- "Digitale Wägeeinrichtungen" (Digital weighing equipments) by K. Homilis,
- "Verfahren und Geräte der digitalen Fernmessung" (Methods and devices for digital remote metering) by E. Weber,
- "Verfahren und Geräte für einfache digitale Operationen" (Methods and devices for simple digital operations) by K.J. Liesmann,
- "Die Einsetzung von Digital-Geräten für die Meßdatenverarbeitung" (The use of digital devices for measured data processing) by H. Dornik.

Berlin Institute for Automation Research

The Berlin Senate has announced that a research institute for automation is to be established in Berlin this year. The institute will work on basic and industrial research. The West German Government has advanced two million DM from funds of the European Reconstruction Programme for the 1963 budget. Initial costs are being borne by the Berlin Senate and it is hoped that assistance will be forthcoming from the Ford Foundation.

Symposium on industrial electronics

The Institute for Industrial Electronics of the Vienna Technical University and the Institute for Electrical Systems and Control Techniques of the Hannover Technical University jointly organize in Hannover, on December 4-7, 1963 a symposium on industrial electronics.

The following 16 papers - all of which will be published in a special issue of the magazine "Die Elektrische Ausrüstung", Vogel-Verlag, P.B. 8700, Würzburg, Germany, and sold at a price of DM 35 - will be read:

- "Elektronik im direkten Industrieinsatz als Teilgebiet der Elektronik" (Directly-integrated industrial electronics as a partial field of electronics) by Prof. Dr. von Hertele, Vienna,
- "Punkterosion" (Spark erosion) by Dipl.-Ing. Ullmann, Leoben,
- "Lasers für die Materialbearbeitung" (Lasers for material processing) by Dr.-Ing. Frühl, Hamburg,
- "Materialbearbeitung mit Elektronenstrahlen" (Materials processing by means of electron radiations) by Mr. Stegerwald, Oberkochen,
- "Stromrichter und Transduktor als Verstärkungssysteme und Stellglieder" (Rectifiers and transducers as amplifying systems and actuators) by Prof. Dr. Brückner, Hösels,
- "Elektronische Schaltkreise und Verstärker für die Anwendung in der Prozeßautomatik" (Electronic switching circuits and amplifiers for use in process control) by Dipl.-Ing. Danner, Karlsruhe,
- "Positionierung und Positionserfassung" (Positioning and position processing) by Dipl.-Ing. Zeman, Vienna,
- "Zählgeräte" (Counters) by Mr. Reaney, Nottingham,
- "Bedeutung und Umfang der Datenerfassung" (the significance and scope of data processing) by Dr. Clever, München
- "Physik der Thermoelemente und deren Anwendungsprobleme" (Thermocouple physics and their application problems) by Dr. Borski, Hanau,
- "Piezoduktoren" (Pressure transducers) by Dipl.-Ing. Dahl, Wiesbaden,

- "Abgriffprobleme für Zeigerregler, Manometer, Durchflußmesser und andere Zeigergeräte" (Sampling problems for indicating regulators, pressure gauges, flow meters and other indicating instruments) by Dipl.-Ing. H u c k, Frankfurt,
- Die Anwendung elektronischer Rechenanlagen zur Steuerung chemischer Prozesse (Prozessoptimierung)" (The application of electronic computers to chemical process control (process optimization) by Dr. K u c k, Sindelfingen,
- "Digitale Meßwertfassung und Übertragung" (Digital processing and transmission of measured values) by Dipl.-Ing. K n o p, Frankfurt,
- "Injektionslaser für Informationsübertragungen" (Injection lasers for information transmissions) by Dr. von M ü n c h, Böblingen.

United Kingdom

The following lectures, conferences and meetings have been recently held or will take place in the future:

U.K.A.C. Annual Lecture

The Third Annual Lecture was given on Wednesday, 9th October 1963, in The Institution of Electrical Engineers, London W.C.2. The lecturer was Sir Edward P l a y f a i r, who had chosen for his subject "Computer and Management".

Conference on Education in Control Engineering

The Meeting was held at Imperial College of Science and Technology, London S.W. 7, on Wednesday, 30th October, 1963.

The morning session under the chairmanship of Mr. G.M.E. W i l l i a m s was opened by Prof. J.C. W e s t with a lecture on "The teaching of control engineering in existing courses".

The afternoon session under the chairmanship of Prof. J.H. W e s t c o t t was opened by Prof. G.D.S. M a c L e l l i a n with a lecture on "The teaching of engineering generally from the standpoint of control engineering".

Further Meetings

Nov. 14, - The Coventry Technical College held a one-day Conference on Automation as the finale of the N a t i o n a l P r o d u c t i v i t y e a r in Coventry. Four papers were given by lecturers representing largest automation firms in the country.

Jan. 17, - A symposium on "Processes Control 1964" is scheduled by the Society of Instrument Technology, 20 Peel Street, London W.8.

Jan. 31, - Institution of Mining Engineers 123rd General Meeting at Grosvenor House, Park Lane, London W.1. Paper to be read on "Remote Mining Control" and "Control" by J. Sheldon, A.E. Bennett, R.W. Wrathall and J.H.R. Cope.

March 11, - Exposition meeting on "New analogues techniques for control systems" organized at Battersea College of Technology jointly by the Society of Instrument Technology and the Institution of Electrical Engineers.

April 14th - Conference on Automatic Control in the Chemical Processes and Allied Industries to be held at the Donnan Laboratories, University of Liverpool. Further details from General Secretary, Society of Chemical Industry, 14 Belgrave Square, London S.W. 1.

May 13, - "A punched-card system for the speed control of an extremum problem" at the Society of Instrument Technology, 20 Peel Street, London W. 8.

U.K.A.C. Report Back Conference

Resulting from the Second International Congress of the International Federation of Automatic Control in Basle, from 28th August to 4th September, 1963, the U.K.A.C. is organising a Report Back Conference to examine and appraise the Basle proceedings and to study the important aspects in greater detail. A team of rapporteurs, all of whom took part in the Basle Conference, will present synopses of the various sessions. This Conference will be held on 7th to 9th January, 1964, at Manchester College of Science and Technology, Manchester.

USA

18th Annual ISA Instrument-Automation Conference and Exhibit The Instrument Society of America (I.S.A.) held its 18th Annual Instrument-Automation Conference and Exhibit in Chicago, from September 9 to September 12, 1963, on a general theme:

FRONTIERS IN INSTRUMENTATION

We have abstracted for publication in this Bulletin, from the very numerous papers read in course of the 70 sessions of this conference, the following title of 63 papers which seem to be of particular interest to Control Engineers. The preprints of

these papers may be obtained from the Instrument Society of America, Penn-Sheraton Hotel, 530 William Penn Place, Pittsburgh 19, Pa., USA, at a price of \$0.75 per paper copy.

- Session 5: Analogs in Training
 - "A Control System Analog for Teaching of Closed Loop Control Theory" by L.M. Zoss,
 - "The Construction and Use of Logarithmic Pole-Zero, Root Locus and Frequency Response Plots" by M.L. Morgan,
 - "Use of Simulators and Training Instruments" by E. Sommer.
- Session 8: Strain Gages Applied to Control Systems and Semiconductor Strain Gages
 - "The Strain Gage, Key Element in a Force Control System" by I.R. Islander.
- Session 9: Process Control in the Metals Industry
 - "Optimizing Control of Slab Re-Heating Furnace" by Y. Nozaka, S. Hagiwara, A. Yoshida, and T. Morisuye,
 - "Control of Batch Type Annealing Furnaces by Optimum Heat Computer" by J.L. Garrison and W.R. Haden Jr.,
 - "Development of an Optimum Heating Policy for a Batch Type Heating Furnace" by J.L. Marcus.
- Session 14: Electronic Power Instruments
 - "Control and Instrumentation at Pathfinder Atomic Power Plant" by D.H. Lepke and L.O. La Tourette,
 - "Features of AC Servomechanism Control Systems" by C.H. Smoot.
- Session 21: Computer Control and Systems Engineering
 - "A Batch Reactor Control Study" by M.D. Weiss and L.A. Schafer,
 - "Advanced Instrumentation and the Control Computer" by H.H. Plum.
 - "Instrumentation Systems and Instrument Development for Paper Industry Process Control" by C.W. Carroll,
 - "Application of a Digital Computer in a Cement Plant" by D.D. Bedworth and J.R. Fallace.
- Session 22: Aerospace Data Handling
 - "An Automatic Checkout Device for the Guidance System of a Missile" by L.E. Metcalfe.
- Session 24: Nuclear Instrumentation
 - "Transfer Functions of Linearized Multi-Region Reactor" by T.J. Higgins.

- Session 29: Automatic Control Systems
 - "Matrix Valve: A Programmable Fluid Power Control Valve" by R.W. Henke,
 - "A New Approach to control System Communications" by J.K. Kooser and J.J. Sabauskas,
 - "Investigation of a self-Adaptive Three-Mode Controller" by D.W. Pessen,
 - "Sampled-data Representative System: An Effective Concept for Use in the Analysis and Synthesis of Distributed-Parameter Systems" by T.J. Higgins and D. Pierre.
- Session 30: New Techniques in Process Instrumentation
 - "Controlling a High Viscosity Process with an On-Stream Rotational Viscometer" by R.W. Scott.
- Session 31: Developments in Solid State Controls
 - "A new Controller for Central Station Use" by D.R. Hyer.
- Session 32: Digital at Work
 - "Supervisory Control of an operational Pipeline with Computer Assistance" by A.C. Winter,
 - "Multi-Element Liquid Blending by Digital Techniques" by P. Jenny,
 - "Digital Sub-System Control of Steel Mill Processes" by R.W. Clarke.
- Session 35: Food Industry Instrumentation
 - "New Developments in Food Processing Automation" by J.A. Perry, Jr.,
 - "Automatic Control of Dissolved Solids" by G.E. Stackhouse,
 - "Automation of a Sugar Pan" by N. Rosenberg.
- Session 39: Pipe Line Systems
 - "A Multi-Station Remote Control and Data Handling System with Flexibility" by D.E. Stark and R.A. Sylvester.
- Session 40: Analog Computer and Processes
 - "Further Development in Chemical and Petroleum Process Control" by P.N. Nikiforuk,
 - "The Use of an Analog Computer to Simulate Process Control Elements" by C.R. Hornay,
 - "On-Line Data Reduction Using Analog Computers" by R.W. Howe,
 - "Computer Control in Refining and Petrochemicals" by G.L. Farrer,
 - "The Application of Statistical Methods in Evaluating the Accuracy of Analog Instruments and Systems" by C.S. Zalkind.

- Session 45: Final Control Elements
 - "Valve Flow Characteristics" by O.O. Lovett, Jr.;
 - "The Development of a Universal Gas Sizing Equation for Control Valves" by J.F. Buresh and C.G. Schuder;
 - "Precise Mass Flow Measurement Using Inferential Methods" by R. Kuttner;
 - "On Determinations at System Operating Conditions" by S.F. Iaha and T.J. Grogan.
- Session 46: Food Industry Instrumentation
 - "Automatic Package Weight Control on a Volumetric Filling Operation" by T.G. McBrady.
- Session 50: Special Instrument and Control Problems in the Pipeline Industry
 - "Essential Liquid Pipe Line Controller Characteristics" by H.A. Brainerd;
 - "The Overlooked Step in Pipeline Automation" by M.W. Levy;
 - "Computers for Scheduling and Dispatching" by H.H. Ammerman.
- Session 54: Computer Control Clinic
 - "The First Computer-Directed Food Plant" by G.A. Purocochar;
 - "Automation of a Steam Turbine Power Plant - The Final Step" by H.S. Drewry and J.R. Howard;
 - "Multiplexing Thermocouple Signals to a Computer-Controlled Data System" by L.E. Sheldon;
 - "Control Systems" by M.L. Martin.
- Session 56: State of the Art of Measuring and Control Systems (Panel)
 - "Industrial Measurement and Control Systems" by E.J. Otis, Burke, Jr.
- Session 59: Cement and Lime Instrumentation
 - "Modern Cement Plant Controls" by J.P. Puekett.
- Session 63: Instrumentation Techniques for Difficult Control Applications
 - "Introduction to Relief Valve Applications, Sizing and Vent Header Design" by J. Conison;
 - "Industrial Measurement and Control of Slurries Using Radioisotope Gages" by H.L. Cook, Jr.;
 - "Feedforward Control Applied" by F.G. Shinsky;
 - "Operation and Applications of the Pneumatic Servo-Pump" by J.N. Swarr.

- Session 64: Computer Control Clinic
 - "Spacecraft Automatic Verification Equipment" by L.S. Klivans and A.D. Sior;
 - "Integrated Large-Scale Analog-Digital Control Systems" by H.K. Hovey;
 - "Automatic Reading and Interpolation of Strip Charts and Film Records" by K. Larsen.
- Session 66: Techniques for Control Loop Analysis
 - "Computer Techniques for Frequency Response Analysis" by G.H. Wolfgang, L.M. Zoss, and C.A. Wagner;
 - "On-Plant Applications of Analog Computers" by G.R. Marr, Jr. and H.B.L. Mitchell;
 - "Dynamic Analysis of Process Control Systems" by G.L. Rock;
 - "Stability and Model Control Methods for Superheater Temperature Control" by T.S. Chen and J.W. Schwarzenberg.
- Session 69: Glass Instrumentation
 - "Automatic Control of Recuperative Glass Tank" by W.C. Frenshew;
 - "Unique Combustion Control of a Regenerative Furnace" by H. Nevins;
 - "Development of Automatic Control Systems for Annealing and Decorating Lehrs for Glass Containers" by J.J. McMackin;
 - "The Development of a Diameter Control System for the Tube Blowing Process" by R. Mouldy.

Fifth Joint Automatic Control Conference 1964

The conference will be held at Stanford University, Stanford, California, on June 24-26, 1964. The paper submission deadline is passed. The conference is open to foreign visitors.

For additional information, write to:

General Chairman: Prof. Gene F. Frankel, Stanford University, Stanford Electronics Laboratories, Stanford, California

Program Chairman: Prof. Lofti A. Zadeh, Electrical Engineering Dept., University of California, Berkeley 4, California.

Sixth Joint Automatic Control Conference 1965

We have given in Bulletin no. 15, page 39, some information on the 1965 J.A.A.C. Since then, Mr. Allan R. Catherer has been replaced, as Chairman of the Programme Committee, having undertaken other duties, by Dr. James W. Moore, Associate Professor of the University of Virginia, Charlottesville.

The conference will be held at the Rensselaer Polytechnic Institute, Troy, New York, on June 22-25, 1965. The conference is open to foreign participants.

For additional information write to:

General Chairman: Prof. Sidney Lees, Thayer School of Engineering, Dartmouth College, Hanover, New Hampshire

OR
Program Chairman: Prof. James W. Moore, Dept. of Mechanical Engineering, University of Virginia, Charlottesville, Virginia.

Instrument Society of America

We have also given in Bulletin no. 15, pages 41 and 42, a calendar of meetings organized or jointly sponsored by the I.S.A. Since then, some changes and numerous additional information have been brought to our attention as listed hereafter. The following list does not replace the information that published in Bulletin no. 15 but simply complements it, as it does not contain any information previously given on meetings for which no changes have occurred since. Under these conditions the date of the calendar of ISA jointly sponsored meetings reads as follows:

- April 8-10, 1964, ISA Measurement & Control Instrumentation Division Symposium, Tampa, Florida, with District III Exhibit
- May, 1964, 5th National ISA Pulp and Paper Instrumentation Symposium, Vancouver, Canada.
- May, 1964, 7th National ISA Power Instrumentation Symposium, Denver, Colorado.
- May 4-5, 1964, 5th National ISA Chemical & Petroleum Instrumentation Symposium, Du Pont County Club, Wilmington, Delaware.
- May 4-6, 1964 (date changed), 10th National ISA Aerospace Instrumentation Symposium, Baltimore Hotel, New York City.
- May 25-28, 1964, 13th National Telemetering Conference, with exhibit. Co-sponsors: Los Angeles, ISA, AIAA, IEEE
- June, 1964, 2nd National ISA Biomedical Science Instrumentation Symposium, New Orleans, Louisiana.
- June 1-3, 1964, 10th National ISA Analysis Instrumentation Symposium, with Northern California Section "ISA-Day" and Exhibit. Palace Hotel, San Francisco, Calif.

- Sept. 1964, 13th Industrial Electronics Symposium, Co-sponsors: ISA, IEEE
- 1965, 6th National ISA Chemical & Petroleum Instrumentation Symposium, Oakland, Calif.
- March 17-18, 1965, 15th National Conference on Instrumentation for the Iron & Steel Industry. Pick-Roosevelt Hotel, Pittsburgh, Pa.

Case Institute of Technology

We reproduce hereafter a paper on recent trends in fluid-by-fluid control and on research work carried in this direction at the Case Institute of Technology, Cleveland, Ohio. This paper, published in "Case Work", Vol. 5, No. 3, 1963, seems to be, indeed, of a general interest to many control engineers.

THE SWITCH TO FLUIDS

Electronic switches or bistable elements are the heart of modern computing and control devices. Basically such bistable elements have either an "on" or "off", "yes" or "no" kind of behaviour. However, electronic bistable elements have some disadvantages. They will not operate in the high temperature and high radiation environments often encountered in some applications.

FLUID VALVES are also used in many control systems. However, conventional valves are expensive and have moving parts to wear and tear.

In 1959, engineers at the Diamond Ordnance Fuse Laboratory discovered a way to control a fluid by a fluid, using a small jet to control a higher power jet. This discovery opened up a new horizon in control and computer engineering involving the use of fluid control. Such devices could be pure fluid amplifiers or possess bistable properties or "memory" of their own.

Presently underway at Case is an investigation to demonstrate the economical use of these pure fluid devices in the field of control engineering. The project is under the direction of Dr. Charles E. Felt, Assistant Professor of Engineering.

Basically a fluid switch, such as those under study at Case, resembles a "stick drawing" of a man. The main jet enters at the head, control jets enter at the position of the outstretch- ed arms on either side, and can move the main jet back and forth from one wall of the device to the other. Exit is provided through two "legs" or openings, angled away from the "body". It is possible to use any kind of fluid - liquid or gas - in such a device.

One study at Case, however, is being undertaken with compressed air. The jet of compressed air enters at the head. In the variable elements under the action of one of the "arm" jets, the main jet is deflected to one wall of the device. The passage

of the jet lowers the pressure along that boundary wall and pulls the jet toward the wall. A low pressure "bubble" forms between the main jet and the wall, holding the jet to the wall. Now if the control jet in the "arm" adjacent to the bubble sends flow into the bubble, the pressure in the bubble rises and the main jet swings over to the other "leg" establishing a bubble between the jet and the opposite wall. A proportional amplifier can be made by designing the element so that the bubble cannot form.

In studying the fundamental characteristics of these pure fluid devices, certain obvious advantages appear. Pure fluid devices are small in size. Five elements can occupy the volume of a 25 cent piece. They are relatively low in cost and a great many switching elements can be incorporated on a 5 x 5 inch piece of glass. They also provide power amplifications of from 10 to 5,000 times. They will operate at high temperatures in high radiation environments. There is no mechanical-to-fluid conversion needed, since a fluid signal can be used to activate another fluid. There also is the possibility that a turbine can be used as a servo actuator with a pure fluid element controlling the flow to the turbine. Under investigation is the design of circuits using such devices, and the best shape and size for the elements.

Pure fluid elements, however, do have some disadvantages. They are slower than corresponding electronic elements. Their speed is decreased as element size increases and as fluid density increases. On the other hand, separate elements can be hooked together to use the output of one element to control other elements. Studies are underway to construct servo systems utilizing high power level fluid devices with turbines to convert the energy of a jet directly into a mechanical output. In the circuitry studies, the synthesis of pneumatic feedback, counting and amplification circuits is being undertaken.

Yugoslavia

International Symposium on Sensitivity Analysis of Nonlinear Systems

This Symposium, organized by the Yugoslav Committee for Electronics and Automation in cooperation with the IFAC Theory Committee has been already mentioned in the present Bulletin page 21. We can give now the following tentative programme of this Symposium:

1. P u r p o s e o f t h e S y m p o s i u m

Analysis and synthesis of dynamic systems in parametric space is receiving growing interest in automatic control theory. Much effort has been invested in recent years in the analytical study of parameter influence on the general system behaviour with particular attention being devoted to the use of computers. It has become a general practice to use the term sensitivity

analysis for this type of study of dynamic systems. The Yugoslav Committee for Electronics and Automation feels that an international symposium devoted to the discussion of the general impact of sensitivity analysis on the study of nonlinear systems would be both valuable and fruitful.

2. P r o p o s e d T o p i c s

- a) Validity of sensitivity coefficients. Sensitivity coefficients are usually defined for parameters that do not change the order of the system and that are not varying with time. It is of interest to discuss the merits of sensitivity analysis for systems having parameters with singular (bifurcation) values, parameters varying with time and parameters changing the order of differential equations that describe the system.
- b) Sensitivity and stability. There exist definite relations between system stability in time and sensitivity domains. These relations can be used to study stability against perturbations of system parameters (structural stability), perturbations of initial conditions and limit cycles.
- c) Sensitivity and adaptive systems. The knowledge of sensitivity coefficients facilitates the use of gradient methods in the design of adaptive systems. The advantages and practical results of this approach may form the basis for a fruitful discussion.
- d) Sensitivity in large. Sensitivity coefficients are normally defined for small parameter perturbations. It is necessary to define sensitivity in parametric space, i.e. to define sensitivity coefficients depending on parameter values. Methods and practical applications should be discussed.
- e) Inverse sensitivity. The problem of determining the parameter perturbation which cause a given disturbance in system transient response forms the basis of inverse sensitivity analysis. Practical implications of the problem are important in establishing analytical relations between system performance and component tolerances and in controlling the errors of complex systems.

3. P a p e r s a n d D i s c u s s i o n s

It is intended to provide ample time for discussion and in general to organize the symposium as a series of round table sessions rather than a meeting devoted to formal presentation of papers. An outstanding expert will be invited to present an introductory paper on each of the suggested topics.

4. P l a c e a n d P l a c e

The date of the symposium, which is planned to last five days tentatively set for the end of August - beginning of Sept. 1964, the proposed location is Dubrovnik, a seaside resort on the southern Adriatic Coast. More information by the

Yugoslav Committee for Electronics and Automation, Belgrade, Yugoslavia, P.B. 356.

PUBLICATIONS

Belgium

- 4.0.0. Les Capteurs (THE SENSORS), by M. A. J. n. b. i. n. d. e. r., E. B. u. c. h. e. t., J. F. a. f. c. h. a. m. p. s. and R. M. o. l. l. e. Brussels Presses Académiques Européennes, 1963, 221 p.
- 4.0.5.0. Colloque "Techniques modernes de calcul et automatique industrielle" (SYMPOSIUM "MODERN COMPUTING TECHNIQUES AND INDUSTRIAL AUTOMATIC CONTROL"). Brussels, Presses Académiques Européennes, 1963, 192 p.

Czechoslovakia

- 1.2.0. CYBERNETIC QUESTIONS OF PHILOSOPHY. Praha. Nakladatelství Politické Literatury, 1962, 373 p., 4 illus., 25 Kcs.
- 1.2.0. MACHINE AND THINKING, by Z. R. o. v. e. n. s. k. i. i., A. U. z. h. o. m. o. v. and J. U. z. h. o. m. o. v. a. Praha, Orbis, 1962, 178 p., 11 Kcs.
- 1.2.0. THE MACHINES HELP TO THINK. Praha, Nakladatelství CSAV, 1962, 152 p., 40 illus., 7,40 Kcs.
- 1.2.1. CYBERNETICS AND TRANSPORT AUTOMATION. Praha, Nakladatelství Dopravy a Spoju, 1962, 218 p., 16,20 Kcs.
- 2.2.0. GENERAL CONTROL SYSTEM. Praha, Zavody Prumyslove Automatizace, 1962, 115 p.
- 2.3.2.0. NON-LINEAR CIRCUITS by Z. K. o. t. e. k. and S. K. u. b. i. k. Praha. Státní Nakladatelství Technické Literatury, 1962, 216 p., 212 illus., 40 Kcs.
- 4.0.0. CONTROL SYSTEMS by Z. D. r. a. b. Praha. UTEIN, 1962, 84 p., 56 illus., 18 Kcs.
- 4.1.5. ASSEMBLING AND MAINTENANCE OF ELECTRIC CONTROL SYSTEMS by J. P. e. t. r. Praha. Státní Nakladatelství Technické Literatury, 1962, 206 p., 165 illus., 15,30 Kcs.
- 4.2.1.1. DIFFERENTIAL CAPACITOR DISPLACEMENT SENSORS by V. A. A. c. h. u. k. o. v. s. k. i. i. Praha, Státní Nakladatelství Technické Literatury, 1963, 136 p., 69 illus., 5 Kcs.
- 4.4.1.1. ELECTRONIC INDUSTRIAL AMPLIFIERS by B. W. a. g. n. e. r. Praha. Státní Nakladatelství Technické Literatury. 1962, 200 p., 264 illus., 18,90 Kcs.
- 4.4.2.1. ELECTROMAGNETIC POLARIZED RELAYS AND CONVERTERS by J. I. D. e. k. a. b. r. u. n. o. v. a. Praha. Státní Nakladatelství Technické Literatury, 1963, 156 p., 88 illus., 5,50 Kcs.

- 4.5.3.0. MEMORY ELEMENTS by L. D. K. r. a. j. z. m. e. r. Praha. Státní Nakladatelství Technické Literatury, 1962, 140 p., 47 illus., 4,30 Kcs.
- 5.0.0. AUTOMATION by L. D. e. m. b. o. v. s. k. y. Praha. Státní Nakladatelství Technické Literatury, 1962, 200 p., 165 illus., 11,20 Kcs.
- 5.0.0. TECHNOLOGICAL FUNDAMENTALS OF AUTOMATIC INDUSTRIAL PRODUCTION by F. S. D. e. m. i. a. n. u. k. Praha. Státní Nakladatelství Technické Literatury, 1962, 600 p., 263 illus., 44,50 Kcs.
- 5.3.1.1. CONVERTOR AUTOMATION by J. J. i. c. h. a. and J. H. e. m. e. o. Praha. Státní Nakladatelství Technické Literatury, 1962, 236 p., 174 illus., 8,40 Kcs.

- 5.6.2.1. DIGITAL CONTROL OF MACHINE-TOOLS by J. T. i. u. s. t. y. and J. Z. o. l. e. n. y. Praha. Státní Nakladatelství Technické Literatury, 1962, 292 p., 290 illus., 18,90 Kcs.
- 5.7.2.1. REMOTE CONTROL OF RAILWAY RECTIFIER STATIONS by J. H. o. l. e. o. h. t. a. Praha. Nakladatelství Dopravy a Spoju, 1962, 176 p., 62 illus., 4,80 Kcs.
- 6.0.0. GEN 01 0170 CONTROL ENGINEERING TERMINOLOGY. Praha. Gen pro Normalizaci, 1961, 57 p., 15 Kcs.

France

- 1.1.3.0. Analyse non-linéaire (NONLINEAR ANALYSIS) by J. W. G. u. n. n. i. n. e. h. a. m. Paris. Dunod, 1963, 368 p., 170 illus., 60 F.
- 1.1.6.0. Théorie des processus markoviens (MARKOV'S PROBABILITY THEORY) by E. B. D. y. n. k. i. n. Paris, Dunod, 1963, 204 p., 89 F.
- 1.1.6.0. Méthode des moindres carrés (SMALLEST-SQUARES METHOD) by I. V. L. i. n. n. i. k. Paris. Dunod, 1963, 356 p., 14 illus., 96 F.
- 1.1.7.1. Algèbre et logique (ALGEBRA AND LOGICS) by G. G. o. l. i. n. and W. S. J. e. v. o. n. s. Paris. Albert Blanchard, 1962, 188 p., 14 illus., 10 F.
- 2.3.1.4. Systèmes asservis: calcul par la méthode "pbles à résolutions" (SERVO-SYSTEMS: DESIGN BY THE ROOM-LOCUS METHOD) by G. J. a. s. e. r. Paris. Albert Blanchard, 1962, 176 p., 106 illus., 86 F.
- 2.3.1.4. Introduction à la théorie des systèmes échantillonnés (INTRODUCTION TO THE SAMPLED-DATA SYSTEM THEORY) by G. J. a. u. n. o. e. r. Paris. Dunod, 1963, 165 p.
- 2.3.1.9. Technique de la régulation par semi-conducteurs (SEMI-CONDUCTOR CONTROL TECHNIQUES) by J. Z. e. u. d. and B. P. P. a. r. i. s. Paris, Dunod, 1963, 140 p., 129 illus., 26 F.

- 4.4.1.1. Amplificateur basse fréquence (LOW-FREQUENCY AMPLIFIER) by A. S c h u r e. Paris, Dunod, 1962, 106 p., 38 illus., 8 F.
- 5.0. Régulation automatique industrielle (AUTOMATIC PROCESS CONTROL) by D.P. E c k m a n n. Paris, Dunod, 1963, 408 p., 249 illus., 68 F.
- 5.8.1.1. Elements de commutation générale: application aux systèmes de téléphone automatique (GENERAL SWITCHING ELEMENTS: APPLICATION TO AUTOMATIC TELEPHONE SYSTEMS). Paris Eyrolles, 1963, 383 p.

C.N.A.A. (Centre National de l'Automatisation)

- The C.N.A.A. - French National Automation Centre - has published in July 1963 a special issue of its Information Bulletin containing the following lectures on industrial computer automation:
 - Emploi des calculatrices dans la fabrication. Examen des calculatrices en service dans le monde à cet usage (Application of computers in manufacturing. Review of computers used in this respect in the world) by Mr. J a r l e t o n.
 - Signalisations centralisées dans l'industrie (Centralized signalling in industry) by Mr. H a r r a n d.
 - Contrôle et conduite optimale des centrales électriques, thermiques et nucléaires (Supervision and optimal control of thermal and nuclear power stations):
 - a) Régulation et traitement de l'information (Control and information processing) by Mr. M é t i v i e r.
 - b) Contrôle économique, optimisation et automatisation des arrêts et démarrages (Economic supervision, optimizing and automation of starting and stopping operations) by Mr. G r u n b e r g e r.
 - Contrôle de fabrication du papier par calculatrice (Paper mill supervision by computer) by Mr. C a r r i e r.
 - Utilisation des calculatrices dans les programmes de découpe (The use of computers on cutting machine programmes) by Mr. P e r r i n.
 - Contrôle de marche de trains de laminaires (Supervision of rolling mill lines operation):
 - a) Automatisation par calculatrices des laminaires reversibles à chaud (Computer automation of hot-strip reversible rolling mills) by Mr. V e r s i n i.
 - b) Conduite centralisée d'un ensemble aciérie - train dégrossisseur (Centralized control of a steel mill coupled with a rough-dressing rolling mill line) by Mr. R e t.
 - Automatisation de hauts-fourneaux (Blast-furnace automation) by Mr. C a r r i e r.

- Emploi d'une calculatrice dans un dispatching de gaz et un dispatching d'électricité (The use of a computer in a gas-distribution station and a power-distribution station) by Mr. G a u d e r n a u.
- Emploi de calculatrices dans l'industrie du tissage (Application of computers to weaving industry) by Mr. I o m p h e.

This special issue can be obtained from:
Centre National de l'Automatisation
14, rue de Staal
Paris (15), France.

Germany

- Ökonomische Methoden in der linearen Planungsrechnung (ECONOMICAL METHODS IN LINEAR PROGRAMMING COMPUTATION) by Mr. H o b n o b e r g e r. Hamburg. R. von Decker's Verlag, 1963, 166 p., 118 illus., 29,50 DM.
- Probleme der Kybernetik (PROBLEMS OF CYBERNETICS) by Mr. I n p u n o v. West Berlin. Akademie-Verlag, 1962, 360 p.
- Zeitfunktionen. Theorie und Anwendung. Theoretische Grundlagen der Technischen Kybernetik (TIME FUNCTIONS, THEORY AND APPLICATION. THEORETICAL FUNDAMENTALS OF ENGINEERING CYBERNETICS) by H. D o b e s c h and H. S u l a n k o. East Berlin. VEB Verlag Technik, 1962, 160 p., 129 illus., 8,70 M.
- Grundkurs der Regelungstechnik (BASIC COURSE ON AUTOMATIC CONTROL) by L. M e r z. München. R. Oldenbourg Verlag, 1963, 175 p., 230 illus., 14,80 DM.
- Einführung in die Dynamik selbsttätiger Regelungs-systeme (INTRODUCTION INTO DYNAMICS OF AUTOMATIC CONTROL SYSTEMS) by P. H. E f f e r t z and F. K o l b e r g. Düsseldorf. VDI-Verlag, 1963, 416 p., 403 illus., 122 DM.
- Grundlagen der Struktursynthese von Relaischalt-schaltungen (FUNDAMENTALS OF RELAY CIRCUIT STRUCTURE SYNTHESIS) by H. H. H o g e n. München. R. Oldenbourg Verlag, 1961, 304 p., 106 illus.
- Lehrmaschinen in kybernetischer und pädagogischer Hinsicht (TEACHING MACHINES FROM THE CYBERNETIC AND PEDAGOGIC POINT OF VIEW) by H. F r a n k. Stuttgart, Ernst Klett Verlag & München, R. Oldenbourg Verlag, 1963, 128 p., 31 illus., 10,60 DM.
- Bauelemente der Regelungstechnik. Band I: Meßein-leitungen, Verstärker, Stellrichtungen (AUTOMATIC CONTROL ELEMENTS. VOL. 1: MEASURING DEVICES, AMPLIFIERS, ACTUATING DEVICES) by V. V. S o l o d o v n i k o v. East Berlin. VEB Verlag Technik, 1963, 736 p., 76 M.

- 4.0.0. Bauelemente der Regelungstechnik. Band II: Korrektur- und Rechenglieder (AUTOMATIC CONTROL COMPONENTS. VOL. II: CORRECTING AND COMPUTING DEVICES) by V.V. Solodovnikov and K. Ost Berlin. VEB Verlag Technik, 1963, 452 p., 56 M.
- 4.0.1.2. Transistoren in der industriellen Elektronik (TRANSISTORS IN INDUSTRIAL ELECTRONICS) by F. Berger and Hamburg. R. von Decker's Verlag, 1963, 125p., 20 illus.
- 4.0.1.2. Einführung in die Physik der Transistoren (INTRODUCTION TO TRANSISTOR PHYSICS) by W.W. Görtner. West-Berlin. Springer Verlag, 1963, 319 p., 182 illus., 44 DM.
- 4.0.1.2. Transistor-Rechenpraxis (TRANSISTOR CALCULATION PRACTICE) by G. Moller. Hamburg. R. von Decker's Verlag, 1962, 124 p., 69 illus., 18,50 DM.
- 4.0.5.0. Leistungsanalyse elektronischer Rechenanlagen (POWER ANALYSIS OF ELECTRONIC COMPUTING DEVICES) by A.R.V. Nijderberg. Hamburg. R. von Decker's Verlag, 1963, 142 p., 45 illus., 34 DM.
- 4.0.5.1. Rechenanleiitung für Analogrechner (COMPUTING METHOD FOR ANALOGUE COMPUTER) by W. Gili and R. Herchel. Konstanz. Telefunken-Fachbuch, 1962, 15 DM.
- 4.0.5.1. Analogrechner (ANALOGUE COMPUTATION) by W. Gili and R. Lauer. West-Berlin. Springer-Verlag, 1963, 423 p., 336 illus., 68 DM.
- 4.0.5.2. Personaleinsatz in der elektronischen Datenverarbeitung (PERSONNEL INTRODUCTION TO ELECTRONIC DATA PROCESSING) by M. Kallert. Hamburg. R. von Decker's Verlag, 1963, 95 p., 16 DM.
- 4.0.6. Fernsteuerung dezentralisierter Objekte (REMOTE CONTROL OF SCATTERED PLANTS) by V.A. Ilin. East-Berlin. VEB Verlag Technik, 1963, 120 p., 7 M.
- 4.0.6. Informationsübertragung in der Fernwirktechnik (INFORMATION TRANSMISSION IN REMOTE OPERATION TECHNIQUES) by R.R. Vasiliev and G. Shtova. East-Berlin. VEB-Verlag Technik, 1963, 170 p., 9 M.
- 4.2.3.1. Quotienten- und Produktanzeigergeräte (RATIO- AND PRODUCT-INDICATING DEVICES) by C. Moller. Hamburg. R. von Decker's Verlag, 1963, 154 p., 82 illus., 28 DM.
- 5.6.2.5. Automatisierung im Maschinenbau (AUTOMATION IN MACHINE-BUILDING) by G.A. Shumina. East-Berlin. VEB Verlag Technik, 1961, 200 p., 111 illus.

Netherlands

- 1.1.6.0. Stochastische Processen in de Meet- en Regeltechniek (STOCHASTIC PROCESSES IN MEASURING AND CONTROL TECHNIQUES) by P. van der Graaf and E. Eindhoven. Technische Hogeschool, 1962, 108 p., 53 illus.
- 1.1.7. COMPUTER PROGRAMMING AND FORMAL SYSTEMS by D. H.A. Hoheberg. Amsterdam, North-Holland Publishing Co., 1963, 170 p., 20 fl.
- 4.0.5.2. PROCEEDINGS OF THE IFIP CONGRESS 1962. G.M. Hoogstraal, Editor. Amsterdam, North-Holland Publishing Co., 1963, 600 p., 165 fl.
- 4.0.5.2. ELSEVIER'S DICTIONARY OF AUTOMATIC CONTROL (in English, French, German and Russian). W.E. Clason, Editor. Amsterdam, Elsevier Publishing Co., 1963, 211 p., 2598 terms.

United Kingdom

- AUTOMATIC CONTROL HANDBOOK by G.A.P. Burnett, Editor. London. George Newnes Ltd., 1962, 90 s.
- PROGRESS IN CONTROL ENGINEERING, Vol. I. R.H. Macon, Editor. London. Heywood & Co., Ltd., 1962, 260 p.
- NONLINEAR CONTROL SYSTEMS ANALYSIS. R.H. Macon, Editor. Oxford. Pergamon Press, 1962, 174 p.
- DIGITAL TECHNIQUES by D.W. Davies. London. Arnold & Sons, Ltd., 1963, 158 p., 30 s.
- AIRCRAFT INSTRUMENT CONTROL SYSTEM by C.A. White. London. Odhams Press Ltd., 1963, 320 p., 45 s.
- PROCEEDINGS OF THE DISCUSSION ON MACHINE TOOLS AND AUTOMATIC CONTROL held under the aegis of the B.C.A.C. at the Institution of Mechanical Engineers on the 29th - 30th May 1963, London, The Institution of Mechanical Engineers, 1963, 40 s.
- REPORT OF THE SYMPOSIUM ON AUTOMATIC CONTROL, London, 29th - 30th September 1960. London. The Institution of Mechanical Engineers, 1962, 116 p.

A Renewed Magazine

Continuing with 1963, the International Journal of Electrical Engineering Education (formerly Bulletin of Electrical Engineering Education), edited, from 1948 to 1961, by the late Professor R. P. Anderson, Head of the Electrical Engineering Department in the Faculty of Technology at Manchester University, appears in a new format and is now published quarterly by Pergamon Press, Oxford.

As before, full responsibility for editorial policy remains with the Editors in the Electrical Engineering Department of the Manchester College of Science and Technology.

The Consultant Editor is Professor Colin Adams and the Editor M.G. Hartley. An international advisory panel is under the chairmanship of Sir Willis Jackson.

The annual subscription rates are:

70 shillings for all institutional, industrial and government establishments and educational establishments outside the British Commonwealth, 20 shillings for individuals and for educational establishments within the British Commonwealth.

USA

1.1.5.1. NUMERICAL METHODS FOR SCIENTISTS AND ENGINEERS by R.W. Hamming. New York. MacGraw Hill, 1962, 410 p.

1.2.2. COMPUTER APPLICATIONS IN THE BEHAVIORAL SCIENCES. H. Borko. Editor. Englewood Cliffs. New Jersey, Prentice Hall, 1962, 633 p.

2.0. ANATOMY OF AUTOMATION by G.H. Amber and P.S. Ambler. Englewood Cliffs. New Jersey, Prentice Hall, 1962, 245 p.

2.1.0. SYSTEMS ENGINEERING FOR THE PROCESS INDUSTRIES by T.J. Williams. New York. MacGraw Hill, 1962, 92 p., \$ 4.95.

2.1.5. NETWORK ANALYSIS AND SYNTHESIS by L. Weinberg. New York. MacGraw Hill, 1962, 692p.

2.3.2.4. STABILITY IN NONLINEAR CONTROL SYSTEMS by A.M. Letov. Princeton, New Jersey. Princeton University Press, 1962, 316 p., \$ 8.50.

2.4.1.1. LOGIC, COMPUTING MACHINES AND AUTOMATION by Alice-Mary Hill. Washington, D.C. Spartan Books, 1963, 427 p.

2.4.1.1. SWITCHING CIRCUIT THEORY AND LOGICAL DESIGN. R.S. Ledley, Editor. New York. American Institute of Electrical Engineers, 1962, 341 p., \$ 6.50.

2.5.3. PROCEEDINGS OF THE FIRST INTERNATIONAL IFAC SYMPOSIUM ON OPTIMIZING AND ADAPTIVE CONTROL. Pittsburgh. The Instrument Society of America, 1963, \$ 10.50 (\$ 12.00 abroad).

4.0.0. INDUSTRIAL PROCESS MEASURING INSTRUMENTS. by G.C. Carroll. New York, MacGraw Hill, 1962, 454 p.

4.0.0. INSTRUMENTATION FOR ENGINEERING MEASUREMENT by R.H. Gerini and L.I. Foster. New York. John Wiley & Sons, 1962, 465 p.

4.0.1.2. ELECTRONIC METHODS by E. Bleuler and R.O. Haxby. New York. Academic Press, 1963, 620 p.

USSR

4.0.5.1. ANALOGUE COMPUTATION: THEORY, TECHNIQUES AND APPLICATIONS by S. Fifer. New York. MacGraw Hill, 1961, 4 vol., 1344 p.

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