IFAC
INTERNATIONAL FEDERATION OF AUTOMATIC CONTROL

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2nd Vice-President of IFAC

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Note on Information Bulletin No. 5

The Information Bulletin No. 5 is expected to be published in August 1959. Information to appear in this issue should therefore reach the Editor

Professor Ing. Dr. Victor Broida
Second Vice-President of IFAC
13, rue de la France-Mutualiste
Boulogne-sur-Seine (Seine)/France

not later than July 15th, 1959.

IFAC NEWS

Membership

In our Bulletin No. 3 which has been issued in January 1959 we have announced that totally 20 national organizations have become member of IFAC. Now we can state that also the following organizations have joined IFAC:

21°)	INDIA	The Institution of Engineers (India) 8, Gokhale Road, Calcutta	$ 125
22°)	FRANCE	Association Française de Régulation et d'Automatisme (AFRA) 19, Rue Blanche, Paris	$ 250

Meeting of the Executive Council and the Advisory Committee

On invitation of the Italian National Research Council, the Executive Council and the Advisory Committee of IFAC had a meeting in Rome from March 2 to 6, 1959. All the members of the Executive Council were present with the exception of H.S. Tsien (China) for whom S.M. Chung was present. The other members of the Executive Council are:

H. Chestnut (USA), (President of IFAC), M. Ajnbinder (Belgium), V. Broida (France), J.F. Coales (United Kingdom), G. Evangelisti (Italy), E. Gerecke (Switzerland), A. Letov (USSR), P.J. Nowacki (Poland), G. Ruppel (Germany).

Moreover the following members of the Advisory Committee and guests were present at least during part of the meeting:

J. Balchen (Norway), O. Benedikt (Hungary), D.P. Eckman (USA), F. Foddis (Italy), W. Findeisen (Poland), K. Izawa (Japan), R. Oldenburger (USA), W. Oppelt (Germany), Z. Trnka (Czechoslovakia).

All items of the very large agenda were discussed in a very friendly spirit and with whole-hearted co-operation of each member. The Italian National Committee of IFAC had prepared all facilities and had extended a very friendly hospitality.

The following report is to inform our readers about several resolutions which might be of special interest.

1. Report on the activities of IFAC

Mr. Harold Chestnut, President of IFAC, summarized the progress made during the last year:

a) Membership in IFAC has grown from 12 up to 21 members (22, since this report), more applications being expected.

b) Three IFAC Information Bulletins have been issued (the present one having been issued since).

c) The preparations for the Moscow Congress have made progress, the first invitations being distributed in four languages.

d) The Advisory Committee has made plans for the Technical Committees to be established.

e) Finances are running smoothly.

f) A Nominating Committee for the elections to the Executive Council in September 1959 has been active.

2. Technical Committees of IFAC

The Advisory Committee under the chairmanship of Prof. D.P. Eckman (USA) presented the following recommendations which were approved by the Executive Council:

(a) INTERNATIONAL COMMITTEES

These committees may consist of not more than one representative from each national member organization. The members of these committees are selected by the national member organizations. The chairmen of these committees are appointed by the President of IFAC with the approval of the Executive Council.

There is at present only one international committee, the Advisory Committee. It is the duty of the Advisory Committee to provide overall directions and guidance to the Executive Council regarding the technical work of IFAC. It recommends formation of technical committees, outlines the area of work, and recommends the membership and chairmen of technical committees. It assists the Executive Council in all matters which are necessarily better handled by the representative body.

(b) TECHNICAL COMMITTEES

These committees may consist of one or more members recommended by national member organizations. The membership and chairmen of these committees are selected by the Advisory Committee and are appointed or re-appointed each year. There are at present six Technical Committees, but it is expected that the exact number may change from time to time.

The Technical Committees and their principal areas of activity are:

1. Terminology (Chairman: E. Gerecke, Switzerland) -

   Collection and dissemination of information on the terms, letter symbols and graphic symbols for automatic control. The terminology committees may propose and clarify such terms and symbols.

2. Bibliography (Chairman: W. Oppelt, Germany) -

   Members: Ajnbinder (Belgium), Broida (France), Higgins (USA), Naumov (USSR), Trnka (Czechoslovakia).

   Collection and dissemination of information on any publications of interest in the area of work of IFAC.

3. Education (Chairman: A. Marino, Italy, subject to acceptance) -

   Collection and dissemination of information on the tools, methods, and systems of automatic control education.

4. Theory (Chairman: B.N. Petrov, USSR, subject to acceptance) -

   Problems relating to all phases of stability, response and performance of control systems in either transient and steady states. Special attention should be given to continuous, discontinuous, computing, optimizing, adaptive, and stochastic problems in automatic control.

5. Components (Chairman: G.Boromissza, Hungary, subject to acceptance) -

   Problems relating to all phases of the design, analysis, and experiment on control system elements. Special attention should be given to instruments, transducers, amplifiers, regulators and computing and logic devices.

6. Application (Chairman: N.B. Nichols, USA, subject to acceptance) -

   Control problems relating to all phases of the application of various automatic control techniques. Special attention should be given to Petroleum - Chemical, Aeronautical, Astronautical, Nuclear and Electric Power, and the Metals Industries.

The above six Technical Committees will work directly in the:

a) preparation for Congresses and other special meetings,

b) preparation of a biannual review of the technical state of the art,

c) exchange of information of more specialized nature,

d) preparation or exchange of standards or specifications,

e) preparation of special symbols or terms,

f) outlining of special areas of work.

3. Overlapping of International Activities

There are several international federations the activity of which is more or less overlapping with the field of activity of IFAC. The most important of these federations are: The International Electrotechnical Commission, The International Federation of Analog Computers and another Federation for Information Processing, which might be created in the near future. The Executive Council of IFAC is very anxious not to interfere with what these federations have done or are in process of doing. All necessary steps will be done to co-ordinate the activities and to get an agreement about the dates and locations of international Congresses which might be planned by the different federations.

4. Constitution of IFAC

The Constitution which has been adopted at the Constitutive Assembly of IFAC September 1957 in Paris had found some criticism among several National Member Organizations. A special committee under the chairmanship of Prof. G. Evangelisti (Italy) had collected and co-ordinated all proposals for amendments of the Constitution and has taken these comments as a basis for a new draft which thouroughly was discussed by the Executive Council. The new draft including some more modifications will be submitted to all National Member Organizations before long in order to vote on it on the General Assembly to be held in Chicago in September 1959.

5. Composition of the Executive Council

Prof. E. G e r e c k e (Switzerland) who had been Ordinary Member of the Executive Council has later on been nominated treasurer of IFAC, thus leaving his seat as ordinary member vacant. The Executive Council decided to fill this vacancy according to article 31 of the Constitution until the next elections by nominating Prof. Rufus O l d e n b u r g e r , Purdue University, Lafayette, Indiana, USA, Ordinary Member of the Executive Council.

6. General Assembly Chicago 1959

The General Assembly of IFAC to be held in Chicago on Sept. 16 to 18, 1959, will be preceded by special meetings on September 14 and 15 and will be followed by the annual meeting and exhibition of the Instruments Society of America on Sept. 23 to 25.

IFAC is preparing a Symposium in connection with the ISA meeting on "Instruments and Transducers and their application to Automatic Control" under the chairmanship of Prof. Dr. C.J.D.M. Verhagen, Delft, Netherlands, on Sept. 22.

It is hoped that nearly all member organizations of IFAC will be represented at the General Assembly utilizing the opportunity of visiting the ISA exhibition.

7. IFAC Congress Moscow 1960

The preparations of this congress were discussed very comprehensively. The National Committee of the Soviet Union was asked to postpone the Congress by one day. This means that the Congress should begin on Monday, June 27, 1960 and end on Wednesday, July 6. Technical visits on July 7 and 8 and cultural and technical plant visits in or near Moscow are suggested also for the time during the sessions. Visits of plants far from Moscow will be provided after the Congress. A meeting of the Executive Council should be held on June 24 and 25.

A special Paper Committee was established for selection of papers in case that too many papers are submitted to the Congress. Special attention is drawn to the dead-lines for the submission of abstracts and papers as indicated in the printed invitation which has been distributed during the last months by the Secretary of IFAC and by the National Committee of the Soviet Union. Anybody who is interested in more information about the Congress und who has not yet asked the Secretary of IFAC for information should do so in the near future.

Regarding the translation and interpretation at the Moscow Congress the Advisory Committee made the following suggestions:

1 - All papers should be translated into English by the national member organization of USA.

2 - All papers should be translated into Russian by the national member organization of USSR. All preprints in these two languages.

3 - The papers may be presented in English, Russian, French, or German. If an interpreter is necessary, he may be provided by an informal arrangement with the author.

4 - Oral discussions may be presented in English or Russian, and individual interpreters may be available if desired.

5 - Written discussions may be presented in English, Russian, French or German.

A Committee of Messrs. Coales, Broida and Ragazzini shall deal with the publication of the preprints and proceedings of the Congress.

8. IFAC Publications

The following suggestions made by the Advisory Committee were approved by the Executive Council:

1) The Bulletin is to be considered as the only official publication of IFAC.

2) It is issued by the Secretariat using the material received from the Committee Chairmen and from national members, if the case.

3) Each member organization provides for reprints in its own language and in its own official publications of the whole Bulletin or part thereof, according to its own requirements.

9. Second Congress of IFAC

It has been decided to propose to the General Assembly that the Second Congress of IFAC should be held in 1963 in Switzerland.

EXPENSES FOR A STAY IN MOSCOW

Answering to many inquiries of people who wish to attend the IFAC Congress 1960 we give some information about the expenses for a stay in Moscow.

It is recommended to make travelling arrangements with INTOURIST AGENCY according to one of 4 categories, all of which provide

a) Reception and seeing off of tourists by car or bus,
b) Delivery of luggage,
c) Excursions to be made every day in a car (Class "Lux") or a bus (other Classes) with an interpreter;

moreover, the following services are included:

Class "Lux" (at $ 30 a day):

a) a separate apartment of highest class with bathroom
b) four meals a day

First Class (at $ 17.50 a day):

a) an apartment for 1 - 2 persons with a bathroom
b) four meals a day

Tourist Class A (at $ 12.50 a day):

a) an apartment for 2 persons with a bathroom or a shower
b) three meals a day

Tourist Class B (at $ 10.- a day):

a) an apartment for 3 - 4 persons with a washing room, a bath or a shower in a special room on the same floor
b) three meals a day.

"Class Lux" is for individuals, the three other classes for groups of over 20 members. We understand, however, that such groups will be combined by INTOURIST without the obligation that all members of a group come from the same country.

It is to be understood that the above mentioned prices in US-Dollars are subject to slight modifications. Further information will follow.

TERMINOLOGY AND SYMBOLS

We have published in our Bulletin No. 3 (pages 5 to 10) over the signature of Professor Ed. Gerecke, Chairman of IFAC Terminology Committee, a survey of terminology and symbols in Automatic Control. The following new items are now added to this survey.

I. TERMINOLOGY

Definitions of Relay Terms

The National Association of Relay Manufacturers (NARM) of the USA has published definitions, nomenclature for basic contact forms and graphical symbols for relays which are in common use in the relay industry. The project leader was Professor C. F. Cameron, School of Electrical Engineering of the Oklahoma A. and M. College. These definitions are of great use in the field of automatic control.

II. TRANSISTOR DEFINITIONS

In September 1958 a 4-page project for transistors appeared in Germany:

Begriffe für Transistoren
DIN Entwurf 41.854
Beuth-Vertrieb, Berlin W 15
and Köln.

The project gives very good definitions of the currents, tensions, electrodes, capacities, amplification factors, junction temperatures etc. The project is very useful for the applications of transistors in the Control field.

III. GRAPHIC SYMBOLS

Graphic Symbols for Oil Hydraulic Drives

In Germany the Association of German Manufacturers of Machinery (VDMA), Group for Oil Hydraulic, has issued specifications for pumps, oil motors, cylinders, valves, pipes and accessories which are derived from the American J.I.C. Hydraulic Standards for Industrial Equipment.

These specifications are contained in the VDMA (Verein Deutscher Maschinenbau-Anstalten) publication No. 24.301, pages 1,2, 3,4, and 6. This publication can be obtained from Beuth-Vertrieb in Köln. The specifications are also quoted in the book "Hydraulische Antriebe" ("Hydraulic Drives") by A. Dürr and O. Wachter, published by Carl Hanser Verlag, München.

NEWS FROM NATIONAL MEMBERS

Belgium

R. van Cauwenberghe

As Bulletin No. 3 went to press, we received the news of the death of Professor Robert van Cauwenberghe, president of the Institut Belge de Régulation et d'Automatisme (IBRA). Time only allowed us to publish a short obituary notice on the last page of that Bulletin.

We therefore take this opportunity of reminding you of the main features of the life of the late Chairman of the National Member Organization of IFAC for Belgium.

Born in Gent on April 25, 1883, Mr. van Cauwenberghe graduated as Civil Engineer in the University of Gent in 1906 and as Doctor of Engineering in 1909 in Dantzig. He then became assistent to Professor Roessler in Dantzig. In 1919, he was appointed lecturer at the Mining School of Mons and later from 1922 to 1946 he was professor in the University of Brussels. In that University he organized the laboratories of electric measurement and of high tension as well as, in 1929, on behalf of the Belgian Electrotechnical Committee, the Central Laboratory of Electricity. In April 1956, he was elected Chairman of the Royal Belgian Society of Engineers and Manufacturers.

Czechoslovakia

The Czechoslovakian National Member Organization has changed its name reading now:

Ceskoslovenska Akademie Ved

Ustav Teorie Informace a Automatisace
(Institute of Information Theory and Automation)

Zitnà 28, Praha, Czechoslovakia

Norway

The Norwegian National Member Organization has changed its name reading now:

Norsk Forening for Automatisering

Kronprinsengate 17, Oslo IX, Norway

WORLDWIDE AUTOMATIC CONTROL

Austria

The ÖAA (Österreichischer Arbeitsausschuß für Automatisierung - Austrian Committee for Automatisation) arranged the following

Lectures in Vienna:

On April 16, 1959 - on "Modern Computer Techniques" (Review of the development and limitations of field of activity for analog and digital computing devices. Routine problems. Technical development. Computation centres.

On May 25, 1959 - General Assembly of ÖAA.
Prof. Dr.-Ing.H.Weissmann, "Programming and Automatisation".

On June 16, 1959 - Show of films on Automatisation and Organization.

In the second half of May a visit to the computer installation of the Zuse Company displayed in Vienna has been arranged.

France

UNESCO:

TRAVELLING SCIENCE EXHIBITION ON AUTOMATION

A travelling science exhibition on Automation is being organized by UNESCO.

This exhibition will consist of explanatory panels in three languages (English, French and the language of the country receiving the exhibition), illustrated by drawings, diagrams, photographs etc. Demonstrations in which the public will be able to take part will be given by the director of the exhibition or by demonstrators provided by the host government. The exhibition will also include manufactured equipment, instruments and machines. The visitors will also be shown educational and scientific films.

The provisional plan for the exhibition to be in 4 parts is as follows:

(1) Introduction - General

(2) Theory, principles, methods of application.
Forms of automation. Systems of control and applications.

(3) Fields of application, techniques and recent results.
Industry, agriculture, trade, social life.

(4) New impacts on modes of life, education and culture:
Future prospects.

Germany

INTERKAMA 1960

The INTERKAMA (International Congress with Exhibition on Measurement Techniques and Automatics) will be held in Dusseldorf from October 19 to 26, 1960 under the general presidence of Professor Ed. Gerecke, of the Federal Polytechnic School of Zurich (Switzerland). The Exhibition under the direction of Dr. Pietzsch will comprise the following programme:

Instruments, telemetry and control devices for electric quantities, for process control, for mechanical quantities, for the automatisation of manufacturing processes and for nuclear installations. Moreover analysers for industrial processes and research and devices for processing measured values (such as network models, simulators and other analog or digital elements as well as analog-to-digital converters).

This exhibition will be supplemented by lectures on new types of instruments.

The Congress held under the presidency of Dr. Sturm will include general reports and specialist papers covering 5 to 6 morning sessions.

Applications by prospective exhibitors can be received up to October 31, 1959 by the Nordwestdeutsche Ausstellungs-Gesellschaft (NOWEA), Ehrenhof 4, Dusseldorf, Germany.

Japan

1. First Joint Conference on Automatic Control

This conference, scheduled in IFAC Bulletin No. 2 (page 19), was held on November 11, 12 and 13, 1958 in Osaka.

147 technical papers and 5 special lectures were presented. About 1500 engineers and scientists attended the conference.

This success has lead to a decision to organize a second conference to be held in autumn 1959 in Tokyo.

2. Graphical Symbols

The Standard of Graphical Symbols for Process Instrumentation was included in the Japanese Industrial Standards (JIS Z-8204-1958) in January 1, 1958, and came into force on September 30 of the same year.

Its original draft had been proposed by the Society of Instrument Technology of Japan and then examined by the Governmental Committee for JIS.

The Standard is mostly based upon the Tentative Recommended Practice of ISA, "Instrument Flow Plan Symbols", although various modifications were made taking into account common practice in Japan.

3. Automatic Control of Open-Hearth Furnaces

A practical study on automatic control of open-hearth furnaces has been achieved by the Subcommittee of Measurement and Control of the Iron and Steel Technology Joint Research Society which is organized by the Ministry of International Trade and Industry, the Japan Iron and Steel Federation and the Iron and Steel Institute of Japan.

The Subcommittee consisted of specialists from iron and steel industries all over Japan and has discussed the problem from the practical point of view since 1950. The results were recently compiled into an Instruction Book which contains the following items:

1. - Automatic Control of furnace pressure.
2. - Automatic Control of roof temperature and automatic combustion control.
3. - Gas and air checker temperature measurement and furnace reversal system.
4. - Circuits for automatic reversal.
5. - Miscellaneous measurement and control.
6. - Actual examples of instrumentation and automatic control.

Switzerland

Fifth Symposium of ASPA

The ASPA (Association Suisse pour l'Automatique - Swiss Association for Automatics) has organized its 5th Symposium at the Polytechnic School of the University of Lausanne on May 20th, 1959, The general theme of this Symposium is "Random Processes and Automatic Control."

The following reports and papers are read:

"Introduction and definition of the problem"
by prof. Ed. Gerecke, Zurich

"Random Functions and the Estimation of their Spectrum"
by prof. Blanc, Lausanne

"Harmonic analysis of random magnitudes in Automatic Control"
by Dr. Lucas Pun, Geneva

"Impulse analysis of random magnitudes in Automatic Control"
by Dr. Michel Cuénod, Geneva

"Control of random tension fluctuations in electric networks"
by P. Gaussens, Paris

"Some apsects of statistical computation of close-loop systems"
by M. Pélegrin, Paris

"Optimization procedures for sampled-data and digital control systems"
by Prof. Eliahu I. Jury, Berkeley, USA

USA

THE INSTRUMENTS SOCIETY OF AMERICA 1959 ANNUAL MEETING AND EXHIBIT

This Annual Meeting and Exhibit will take place in Chicago from Monday September 21 to Friday September 25, 1959 on a schedule to facilitate attendance at both functions.

The Exhibit may be expected to draw as many as 30.000 visitors.

Plans made for the Conference include at least 7 major programme events emphasizing the use of computers for running industrial processes. These plans also include the equivalent of one and one-half days of sessions on photo instrumentation and nine presentations are expected to be made on the use of cameras in industrial processing.

Emphasis of the conference on computers is indicated by technical sessions on their use in process control and in sizing control valves as well as sessions on data handling and feedback control systems.

FIFTH INTERNATIONAL AUTOMATIC CONGRESS AND EXPOSITION

This Congress and Exposition will take place in Pittsburgh from Monday November 16 to Friday November 20, 1959.

In addition to the regular program, the Materials Handling Division of the ASME (American Society of Mechanical Engineers) has scheduled meetings on

"Automation in Materials Handling"

The four sessions on two days will be the following:

1. - Systems Engineering
2. - Automatic Materials Handling Systems in Process Plants
3. - Automatic Warehousing
4. - Management and Economic Problems in Automation

Meetings on Numerical Control of Machines and on Plant Layout for Automation have been scheduled. Ten technical sessions are also tentatively planned.

THE WINTER GENERAL MEETING OF THE AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS

The AIEE Winter General Meeting was held in New York during February 1 - 6, 1959. Of special interest was a panel discussion on "Automation in the Soviet Union". Panel members were:

S.W. Herwald, N. Cohn, W.E. Vannah, R.J. Kochenburger, E.J. Kelly.

Feedback Control Systems Sessions were conducted on:

Computers in Control Systems

Progress in Sampled-Data Systems. E.I. Jury, University of California,

Survey of Sampled-Data Systems Analysis. J.V. Howell.

The Stability and Compensation of Saturating Sampled-Data Systems. F.J. Mullin, California Institute of Technology.

A General Approach for Obtaining Transient Response by the Use of a Digital Computer. P.E. Lego and T.W. Sze, University of Pittsburgh.

Case Histories of Computers in Automatic Control

The Closed-Loop Concept of Real Time Flight and Analysis. G. Hintze.

Heat Rate Computer Involving Digital and Analog Multiplexing Controls. G. Jacobi.

Application of Logic Techniques to a Steel Mill. W.D. Rowe, F.G. Willard and F. Di Nicolantonio.

Computer Control of a Butane Isomerization Process. T.Stout.

Adaptive Control System

Use of Mathematical Error Criteria in the Design of Adaptive Control Systems. C. Merriam, Massachusetts Institute of Technology.

Control by Stochastic Adjustment. J.E. Bertram.

Is this an Adaptive System ? G.F. Franklin, Stanford University.

Executive-Controlled Adaptive Systems, R. Staffin, Polytechnic Institute of Brooklyn.

Feedback Control Systems for Metal Rolling and Processing

Feedback Control Systems in the Metal Rolling and Processing Industries. A.W. Smith and J.W. Cook.

The Use of Frequency Response Tests in the Analysis of a Foil Mill Automatic Gage Control. S.J. Jones and R.M. Sills.

Simulation of Steel Mill Control Systems. R.A. Phillips.

Hot Strip Mill Gage Control. O.C. Gochenour.

Nonlinear Control Systems

A Relay-Type Feedback Control System designed for Random Inputs. A.M. Hopkin and P.K.C. Wang, University of California.

A Study of Nonlinear Systems with Random Inputs. K. Chuang and L.F. Kazda, University of Michigan.

A Stability Criterion for Nonlinear Systems. Y.H. Ku and A.A. Wolf, University of Pennsylvania.

Describing Function Measurement with an Electronic Analog Computer. V.L. Larrowe and M.M. Spencer, University of Michigan.

Limit-Cycle Stability Study of a Feedback Control System by a new Describing Function technique. H.J. Harrington.

Theory and Practice of Reactor Control

A Digital Nuclear Reactor Control System. E.P. Gyftopoulos, Massachusetts Institute of Technology and P.M. Coble.

The effect of feedwater Control on a pressurized Reactor. E.F. Borner.

Automatic Control of Boiling Water Reactors. M.A. Head.

Variable Moderator Level Control of Boiling Water Reactor. S.R. Nixon.

A Stability Study of an Atomic Power Plant. R.W. Albrecht, University of Michigan.

The Specifications of Components for Control Systems

Hydraulic Transfer Valves. J. Gibson

Motor Tachometers. W.E. Sollecito

Gyros. P.P. Fischer

Magnetic Amplifiers. H. Trueblood

Transformers. D.D. Pidhayny

Feedback Control Systems - I

Notes on complex Conjugate Singularity Compensation and four terminal Network Loading. P. Chandaket, Royal Thai Navy and A.B. Rosenstein, University of California.

Signal Stabilization of a Control System. R. Oldenburger, Purdue University and C.C. Liu.

Probabilistic Error as Measure of Control System performance. J. Zaborsky, Washington University and J.W. Diesel.

Relay type Feedback Control Systems with Dead Time and Sampling. K. Izawa, Purdue University and L.E. Weaver, University of Arizona. (Re-presented for Discussion only).

Application of Switching transistors and saturable Reactors in a High-Performance Servo. F.B. Cox, Jr. and P.R. Johannessen, Massachusetts Inst. of Technology. (Re-presented for Discussion only).

Classified Bibliography on Feedback Control Systems Part I: Sampled-Data Systems. T.J. Higgins, University of Wisconsin and R.W. Greer.

Classified Bibliography on Feedback Control Systems Part II: Root Locus and Associated Procedures. T.J Higgins, University of Wisconsin.

Classified Bibliography on Feedback Control Systems Part III: Automatic Control of Nuclear Reactors. T.J. Higgins and R.F.Hill, University of Wisconsin.

Feedback Control Systems - II

Effect of closed-loop Transfer Function Pole and Zero locations on the transient response of Linear Control Systems. O.I.Elgerd, University of Florida and W.C. Stephens, U.S. Army Combat Surveillance Agency.

Evaluation of Transient Systems response. F.P. de Mello.

The Optimum Control of multi-actuator Systems. I. McCausland, University of Toronto.

The Linear Least Squares Synthesis of multivariable Control Systems. R.C. Amara, Stanford Research Institute.

Transfer Functions of loaded synchronous machine. D. Hamdi-Sepen, Technical University of Istanbul (Re-presented for Discussion only).

Application of Continuous System design concepts to the design of Sampled Data Systems. S.F. Schmidt, Ames Aeronautical Lab. (Re-presented for Discussion only).

Classified Bibliography on Feedback Control Systems:

Part IV	Obtaining transient response from frequency response
Part V	Obtaining frequency response from transient response
Part VI	Time-Lage Systems
Part VII	Stability Theory

T. J. Higgins, University of Wisconsin.

1959 INSTITUTE OF RADIO ENGINEERS SHOW

The I.R.E. Show took place recently in the New-York City Coliseum. Approximately 60.000 engineers, scientists, salesmen and students attended it and 950 separate exhibitors displayed their products. Amongst the latter, industrial applications of computing control retained the attention of visitors. Details were given on computers in chemical plants, petroleum refineries, steel mills, gas utilities, electric generating plants and even an automobile plant. Recent studies predicted a computing control market evaluated as high as 100 million dollars in 1960.

WESTERN JOINT COMPUTER CONFERENCE

This Conference was held in San-Francisco in March 1959 and was attended by almost 2.000 engineers. Its theme was "New horizons in Computer Technology".

FUTURE JOINT CONTROL THEORY CONFERENCES

In the past, A.S.M.E. (American Society of Mechanical Engineers), I.R.E. (Institute of Radio Enginees), A.I.E.E. (American Institute of Electrical Engineers), I.S.A. (Instruments Society of America) and A.I.Ch.E. (American Institute of Chemical Engineers) have all held special control theory conferences or major sessions at other then their annual meetings. Each has always invited the other societies but the result was still three or four special conferences on nearly identical subjects.

Under the auspices of the A.A.C.C. (American Automatic Control Conference), National Member of IFAC for the U.S.A., these five societies will pool their annual efforts and hold one joint conference on control theory. Sponsorship of the annual joint conference will rotate among these five societies according to the following schedule:

I.R.E.	- 1959 (in autumn)
A.S.M.E.	- 1960
I.S.A.	- 1961
A.I.E.E.	- 1962
A.I.Ch.E.	- 1963

Chairman of the joint-society meeting Steering Committee is N.B. Nichols.

FREE IDEAS, OPINIONS, AND SUGGESTIONS

Note from the Editor

In this issue we introduce a new feature by publishing notes from Professor Ed. Gerecke, Switzerland, on handling industrial control problems through engineering schools which seems to be a significant example of an idea likely to help the promotion of the Science of Automatic Control.

It is our intention in future issues to publish notes by other leaders in the field of automatic control, whose ideas will, we believe, promote the science of Automatic Control amongst nations, which is the aim of our Federation. These opinions, ideas and suggestions cannot be, of course, of a narrow and specialized nature since then they would very soon become excessive in volume.

If this feature developes, as we hope, there should be feedback information as well as feed forward and so we hope that readers send us their reactions, thus creating a correspondence column in our bulletin.

We cannot, of course, promise to publish all the letters and contributions we receive but we will endeavour to publish the most significant opinions, ideas and suggestions (or at least, abstracts, of the latter) - whether they be organizational or technical, providing they are of sufficiently broad general interest. - We shall also welcome suggestions from readers on what they would find of interest in our Bulletin.

In this way we hope to create in our Bulletin a sort of international tribune devoted to Automatic Control which may prove to be of profit to the whole worldwide family of Control scientists and engineers.

Prof. Ing. Dr. Victor Broida

Handling Industrial Control Problems by Engineering Schools

by Professor Ed. Gerecke, Zurich, Switzerland

Interesting Control Problems, for the detailed study of which, however, neither sufficient time nor staff are sometimes available, are frequently raised in industrial practice. Frequently this is the case of problems located near the limits of the fields of interest of the company concerned, but for which a solution would be highly desirable. This can also be the occasion of creating new devices which would not be of interest, for the moment, to a manufacturer. Such problems are then of necessity pushed aside and not solved for years. It can also happen that the staff of the company has not available the theoretical background or the experimental means for solving the problem successfully.

On the other hand, a gradually increasing number of students of Engineering Schools devote themselves to the study of Control Engineering, of Analog and Digital Computing Techniques and of Electronics. In order to complete their training, they have to fulfil a theoretical or practical study - or diploma research - which they frequently carry out with great enthusiasm. It appears that these students are above all interested in practical problems and handle them using theoretical methods. For the solution of such problems a constantly increasing number of students is available. Of course, Engineering Schools can only handle those problems for which they are adapted regard to having staff and equipment. Many Engineering Schools now have considerable means for modernization of their laboratories. Small problems can be formulated as training or diploma research problems. Postgraduate training is of constantly increasing importance and this could include more extensive problems, which would eventually lead to a doctor's dissertation.

It is highly desirable that every time such a problem arises in industry it be submitted to Engineering Schools for study. The formulation of the problem could be made by direct contact with the executives of the Engineering Schools. It would also be possible to publish the formulation of the problem in the IFAC Bulletin.

PUBLICATIONS

Austria

The Austrian Magazine "MTW Mitteilungen" which has now been published for four years has now been converted into a more comprehensive journal with the title "MTW, Mathematik, Technik, Wirtschaft" (mathematics, technology, economy). It is now a journal for modern computation and automation and it is issued by the Institute of Mathematics of the Technical University of Vienna in collaboration with several prominent Austrian and German scientists. This journal is intended to serve those people who already utilize mathematical methods or are interested in the application of modern computation. The publisher is: Stiasny-Verlag, Graz, Austria.

Belgium

The Institut Belge de Régulation et d'Automatisme (IBRA) publishes, outside of its information bulletin, a very interesting technical review under the name of "Revue A" (Revue Automatique).

The first issue of this Review (June 1958) contains the following articles:

Editorial by the late Professor R.van Cauwenberghe, Chairman of IBRA.

"Reflections on automatic control as applied in the machine-tool industry in Belgium" by A. Vandeghen.

"Transients of automatic systems with saturated error signal: optimum and quasi-optimum trajectores" by R. Vasquez.

"Actual control performances of reversing mills fed by Illgner generators" by J. Mulder.

"Industrial Pyrometry" by Max Ajnbinder.

"Elementary automatic assemblies" by Max Ajnbinder.

The second issue of the same Review (October 1958) contains the following articles:

Editorial by Professor J. Hoffmann, Vice-President of IBRA.

"The conditions of automation in Great Britain" by J.F. Coales.

"Random process and automatic control" by M.Cuénod and R.Renchon.

"Purched tape controlled automatic lathe" by R.Bingen, A. Leglise and J. Vroman.

"The automatization of machinery for resistance welding" by L. Faton.

"Machines à calculer electroniques arithmetiques et analogiques" ("Digital and Analog Electronic Computers") by Dr. M. Pelegrin with a preface of General Engineer P. de Valroger, Director of the National High School of Aeronautics. 395 pages, numerous figures. 4.400 French francs. Published by Dunod, Paris 1959.

Germany

New Books

"Dynamische Vorgänge in linearen Systemen der Nachrichten- und Regelungstechnik" ("Dynamic conditions in linear systems of Information techniques and Automatic Control") by Dr. Hans Kaufmann. This book - scheduled to be published in our No.3 Bulletin (page 34) - has been published now by R. Oldenbourg-Verlag, München. 211 pages, 105 figures, 26.50 German marks.

"Meß-Steuerung" ("Measuring Control") - Control of manufacturing process through measuring valves - by Ing. Alexander Haidekker. About 80 pages and 16 figures. To be published by R.von Decker's Verlag, G.Schenck, Hamburg, Berlin and Bonn.

"Planung und Projektierung automatisierter Anlagen" ("Planning and Layout of automatized installation"). A technical and economical survey - by Dr.Ing. Rolf Hofmann. About 130 pages and 20 figures. To be published by R.von Decker's Verlag, G.Schenck, Hamburg, Berlin and Bonn.

Periodicals

In our first list of some entirely or partly specialized reviews published in English, French and German (see our Bulletin No. 2, pages 26 and 27) we have omitted the German review "Automatik" published by R.von Decker's Verlag, G.Schenck, Heimhuderstraße 53, Hamburg 13.

Roumania

"Sur un théorème d'existence dans la théorie algébrique des mécanismes automatiques discrets" ("On a theorem of existence in Sampling-Control Systems Algebra") by Professor Gr.C.Moisil. No. 1 of tome III (1958) of the "Revue de Mathematiques Pures et Appliquées" published by the Academy of Roumania.

United Kingdom

"The theory and design of magnetic amplifiers" by E.H. Frost-Smith edited by John F. Coales. 487 pages, illustrated, 75 shillings, published by Chapman & Hall Ltd., London, November 1958.

USA

"Sampled-Data Control Systems" by Eliahu I. Jury, Associate Professor of Electrical Engineering, University of California, Berkeley, USA. Published in 1958 by John Wiley & Sons, Inc., New-York and Chapman and Hall, Ltd., London.

The main objective of this book is to develop a basic theory that can be applied to sampled-data systems, to other allied fields such as circuits, networks and computers and to the general field of systems engineering.

The theory discussed in the first chapter illustrates the various applications of the Z-transform method, in particular to sampled-data control systems. The theory is developed to such an extent that the reader will be able to pursue an investigation of sampled-data control systems in his work.

The modified Z-transform method discussed in chapter 2 is for the most part an extension of the Z-transform to obtain the system behaviour at all times. The use of digital computers in control systems requires obtaining information about the system behaviour at all times, both for analysis and design purposes. To the end, this chapter covers the investigation of the mathematical model of such systems.

The third chapter continues the analysis in the Z-plane through the use of the root-locus method.

The frequency-response methods discussed in chapter 4 will supplement the Z-transform approach of the first three chapters. It gives another point of view of analysis with which the control engineer is very familiar.

Chapter 5 deals with the synthesis problem and in particular, with the discrete-compensation method in which the discrete and digital processing units are synthetized to yield an acceptable performance.

The continuous-compensation method discussed in chapter 6 is a useful procedure in continuous network compensation of sampled-data control systems. Both frequency-response and time-domain methods are presented in this chapter.

Physical implementation and the various methods available for realizing the discrete compensators discussed in chapter 5 are presented in detail in chapter 7; this supplements the design procedures discussed in the preceding chapters.

Chapter 8 deals mainly with some applications of both the Z-transform and the modified Z-transform in the approximative analysis of continuous systems and in the operational solution of difference equations. This chapter can be studied and discussed after the material of the first two chapters has been digested.

Finally, the exact analysis and stability study of sampled-data systems with finite pulse width and the limitations of the Z-transform are extensively studied in chapter 9. The p-transform method is introduced and its applications to pulse-modulated feedback systems are discussed.