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ABSTRACTS FROM EAST EUROPEAN  
SCIENTIFIC AND TECHNICAL JOURNALS

No. 121

- Electronics, Engineering, and Space Research Series -

This report consists of abstracts of articles from the East European scientific and technical journal listed in the table of contents below.

Table of Contents

	<u>Page</u>
EAST GERMANY	
<u>Messen-Steuern-Regeln</u> , Berlin, Vol 6, No 1, Jan 63	1

EAST GERMANY

KORTUM H., Professor Dr., Research Laboratory for Metrology and Automatization at the German Academy of Sciences in Berlin (Forschungsstelle fuer Messtechnik und Automatisierung in der DAW zu Berlin), Jena.

"On the General Systems Theory and Modern Graphical Methods"

Berlin, Messen-Steuern-Regeln Vol VI, No 1, January 1963  
pp 2-5.

Abstract: The article deals with the concepts of "system" and "elements", their definition and relation to automation and operating processes. There follows a discussion of various physical systems on which automatic control is based, their graphical (diagrammatic) representation. The determination of transfer functions and the solution of systems of equations are the essential requisites in the application of both digital and analog computers, with the use of signal-flow graphs. Twenty one bibliographical references are listed: nine East German, and twelve Western (West German, American, English and French).

1/1

EAST GERMANY

NEIDHARDT P. Dr.-Engr., Berlin.

"Adaptive Systems in Engineering Cybernetics".

Berlin, Messen-Steuern-Regeln Vol VI, No 1, January 1963  
pp 6-14.

Abstract: The article presents an analysis of the learning process in terms of cybernetics and automatic systems. modes of learning are defined (by storage - the lowest mode, by imitation, by trial and error, by optimization, by instruction, and by understanding- the highest mode). The discussion relates to the design of servomechanisms, process controls and automats. The theory of adaptive (learning) systems is to a large extent based on optimum-value loci, which are utilized in any of the methods mentioned here: 1) Gradient method by FELDBAUM, 2) "Steepest Slope" method, and 3) Adaptation Matrix by STEINBUCH.

Thirty seven bibliographical references are listed: twenty four Western and thirteen Eastern.

1/1

EAST GERMANY

LANG K., Graduate Mathematician, Karl-Marx-Stadt.

"The Determination of Approximation Polynomials by Means of the TCHEBYSHEV Polynomials".

Berlin, Messen-Steuern-Regeln Vol VI, No 1, January 1963  
pp 15-22.

Abstract: The article deals with the method for calculating numerical values of transcendental functions. In automatic computers, these values are found by approximating the transcendental function with polynomials. The method described here is based on the definition of TCHEBYSHEV polynomials of n-th degree of the first kind and on calculating their values. Next, the transcendental function is represented by a power series whose coefficients (approximation polynomial) are then determined with the aid of TCHEBYSHEV polynomials. This method is carried out on a hyperbolic function as an example. It is also shown how a transcendental function can be developed directly into a series of TCHEBYSHEV polynomials. Such a process is carried out here and summarized in terms of a flow chart for a computer program. The results are shown on the same hyperbolic function ( $\sinh x$ ). Four references are listed: three Western and one Eastern. 171

EAST GERMANY

SCHWARZE G., Graduate Mathematician, Institute of Regulation Engineering (Institut fuer Regelungstechnik), Berlin.

"Determination of Regulation Characteristics in Measuring Instrument

Berlin, Messen-Steuern-Regeln Vol VI, No 1, January 1963  
pp 23-27.

Abstract: The article deals with those parameters of measuring devices which determine their dynamic behavior. These include the damping coefficient and natural frequency in the case of periodic, or several time constants in the case of aperiodic oscillations. Measured and calculated data are tabulated and plotted on graphs. The underlying principle here is the transformation of the transient time-response function into a transfer function and reverse. Consideration is given to the classification of instruments into four levels of accuracy (2.5, 1.5, 1.0 and 0.5). Results are illustrated on specific examples. This method holds only for the linear case; it is applicable to the non-linear case, if the whole range is broken down into sections and each one assumed to be approximately linear. Three references are listed, all by the same author. 141

EAST GERMANY

BUCHTA H., Grad. Engr. and KELLER D., Grad. Engr.  
Institute of Regulation Engineering at the Technical University (Institut fuer Regelungstechnik, Technische Universitaet), Dresden.

"Feasibility of Deriving a Block Diagram for the Magnetic Amplifier with Variable Gain".

Berlin, Messen-Steuern-Regeln Vol VI, No 1, January 1963  
pp 28-31.

Abstract: The article first defines the operating principle of a magnetic amplifier with variable gain. Next, the equivalent circuit and the block diagram are derived analytically in general form. Two limiting cases are then considered: 1) a voltage-controlling device, when the control resistance is infinite, and 2) a current-controlling device, when the control resistance is zero.

Six bibliographical references are listed: five American and one German.

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EAST GERMANY

HABIGER E., Grad. Engr., Institute of Electrical Machines and Drives at the Technical University (Institut fuer Elektrische Maschinen und Antriebe der Technischen Universitaet), Dresden.

"Transient Behavior of the Polyphase Wound-Rotor Induction Motor, Disregarding Compensating Electrical Phenomena".

Berlin, Messen-Steuern-Regeln Vol VI, No 1, January 1963  
pp 31-37.

Abstract: The article treats the three-phase slip-ring induction motor as a component of a control system and analyzes its transient performance in these terms. Since the transients are generally slow in comparison with the period of the alternating line voltage, therefore electrical compensation may be neglected and only mechanical balance need be considered. Two modes of operation are analyzed: 1) as motor, and 2) with d.c. braking. In both cases, the transfer coefficients and mechanical time constant are functions speed and thus vary within wide limits between standstill and rated speed. Several approximations are made in the analysis as to machine parameters and the torque-speed characteristic. Fourteen references are listed: two Western European, twelve German and other Eastern Europe

EAST GERMANY

WEBER R., Engr., Greiz/Thuringia.

"Humidity Measurement in Paper Machines".

Berlin, Messen-Steuern-Regeln Vol VI, No 1, January 1963  
pp 37-39.

Abstract: The article discusses the effect of humidity on the quality of paper produced in the plant, especially in the semi-finished stage. Humidity is precisely defined for measurement purposes and several modern test methods are described. These are based on the relationship between humidity and electrical properties (dielectric constant, conductivity) of hygroscopic materials. The problems of measurement technique are complex, especially since its ultimate purpose is humidity control and maintaining it at optimum level. The next stage to be considered is that of fully automatic humidity regulation. The article is based on work done on humidity measuring devices at the "Feutron" plant in Greiz and the paper mill in Koenigstein.

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