

TABLE OF CONTENTS

SPACE ELECTROMECHANICS. SPACECRAFT

Gusev A.A., Ilyna I.Yu., Saulsky V.K., Churkin A.L. (JSC «VNIEM Corporation»)

«METEOR» SC SPACEBORN PLATFORM DEVELOPMENT EXPERIENCE.....3
An analysis of tasks, requirements, problems, accepted design solutions, and peculiarities for creation of new space platform (SP) for perspective oceanographic satellite Meteor-M No.3 have been conducted. Main differences of this SP from the unified space platform Resource UKP applied up to now during more than quarter of a century were considered and justified. Construction principles recommended for application at development of perspective oceanographic and hydrometeorological satellites, as well as all-weather survey spacecraft were formed. The new space platform shall become a baseline for the next generation of Land remote sensing satellites in JSC «VNIEM Corporation».
Key words: space platform, hydrometeorological satellite, oceanographic satellite, all-weather survey, basic structure, payload, on-board support system.

Naumenko D.S. (LLC «NILAKT DOSAAF»)

PRECISION INCREASING METHOD FOR FLYWHEEL MOTOR ROTOR SPEED MEASUREMENTS.....13
Analysis of different methods for measuring rotor speed of flywheel motor used in spacecraft attitude control systems was carried out. The proposed combined method enables to increase accuracy of measurements and experimentally confirms a possibility to lower flywheel rotor speed frequency measurement error by a factor of 100 in comparison with conservative methods.
Key words: flywheel motor, attitude control system, measurement error, angular rate, round-off, rate generator.

Ermakov V.Yu., Kuznetsov D.A., Telepnyov P.P., Sova A.N. (FSUE «NPO n.a. S.A. Lavotchkin»)

PROPOSAL ON SOLVING PROBLEM OF VIBRATION PROTECTION OF ELECTRO-OPTICAL
PRECISION HARDWARE OF «SPECTRUM-UF» SC.....17
Milestones of creation of vibrator isolator for precision electro-optical hardware for operation of executive parts on «Spectrum-UF» SC board are under consideration. Calculations of linkage parameters of precision devices confirming desirability of development of vibroinsulator are described herein. A prototype sample was developed on base of created physical model of vibroinsulator. The calculated values of vibration insulation are confirmed by results of tests of executive devices on force-measuring workbench.
Key words: vibroinsulator, magnetic liquid, flywheel motor, electro-optical hardware.

PRODUCTS AND EQUIPMENT TEST PROCEDURES

Grinevich D.V., Lebedev A.V., Moroz O.V. (JSC «VNIEM Corporation»)

DEVELOPMENT OF UNIVERSAL SIMULATING BUNDLED SOFTWARE FOR CREATION OF SPACECRAFT
ATTITUDE CONTROL SYSTEMS DEBUGGING AND SUPPORT WORKBENCHES.....21
A structure of universal simulating bundled software developed in JSC «VNIEM Corporation» and pretended to simulate dynamics of spacecraft movement is under consideration. Numerical algorithms of SC movement simulation forming the basis of this complex and taking into account flexible elements of the alternating structure enabling to execute simulation in real and fast-time scale are presented in this article.
Examples of application of the simulator complex for creation of attitude control systems ground-based debugging workbenches of existent and under construction SC are considered.
Key words: spacecraft, mathematical model, computer simulation.

Gecha V.Ya., Lavrukhin O.N., Meshchikhin I.A. (JSC «VNIEM Corporation»)

RESEARCHING QUALITY CONTROL TECHNIQUES OF CRIMPED CONNECTIONS AT MANUFACTURE
OF HARDWARE OF CONTROL AND PROTECTION SYSTEM ELECTRICAL
EQUIPMENT COMPLEX FOR NUCLEAR POWER PLANTS.....31
The proceeding deals with materials on analysis of quality control techniques for crimping terminals of conductors. The special attention is paid to a numerical simulation of terminals crimping and comparison of obtained results with experimental data. Values of critical force of crimping and separation forces for conductors of different sections were obtained as a result of serial computations.
Key words: control methods, simulation modeling, electrical equipment, numerical methods.

ELECTROMECHANICS AND SOCIOECONOMIC DEVELOPMENT OF THE COUNTRY

Deeva V.S., Slobodyan S.M. (ENIN NITPU)

VACUUM CIRCUIT BREAKER CONTACT COAGULATION MODEL.....39
A connection of change in density of the current supplied via vacuum circuit breaker with offset value of elements of its contact pair as a criterion of worsening physical state and reliability of vacuum circuit breakers caused by operational factors at their practical operation was established.
Key words: vacuum, electrical contact, switch, appraisal.

Karagodin V.V., Gorin V.A., Vishnyakov E.P. (Military space academy n.a. A.F. Mozhaysky)

OPTIMAL FAST ACTION PROBLEMS NUMERICAL SOLUTION.....43
Synthesis of time optimal systems refers to the most important problems of automatic control theory. There is a great deal of unsettled immediate and complicated problems related to development of applied numerical methods determining possibilities of practical use of optimal control theory. A problem of convergence of iteration process to required solution arises at realization of numerical method. A method of task-oriented selection of starting variables values for iteration computation schemes pretended to solve optimization problems was proposed.
Key words: maximum principle, time optimal control, iteration process, numerical methods, initial approximation, convergence.