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Faculty of Military Technology, University of Defence in Brno

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CATE 2007 (Community – Army – Technology – Environment)

International Exhibition IDET 2009,

Brno, Czech Republic

5. - 6. May 2009



Pplk. Ing. Jaroslav Jěřábek, Ph.D. a doc. Ing. Rudolf Jalovecký, CSc. společně s dalšími...



... spolupracovníky na veletrhu IDET 2009 v expozici Univerzity obrany vzorně reprezentovali naši katedru. Na snímku příslušník skupiny Elektrické a speciální systémy por. Ing. Přemysl Janů.



Naši příslušníci se rovněž podíleli na organizačním zajištění celé konference ICMT 2009 – například studenti doktorského studia pomáhali při registraci účastníků konference.



Por. Ing. Josef Bajer při prezentaci jednoho z našich příspěvků na konferenci ICMT 2009.

SECTION: 6. Electronics Avionic Systems

6.5.2009, 13.00 – 16.00

Chairmen : assoc. prof. Ing. Rudolf Jalovecký, Ing. Michal Dub, Ph.D.

Nr.	Author(s)	Paper Title
1	JALOVECKÝ Rudolf BAJER Josef	DEVELOPMENT OF THE AIRCRAFT ELECTRONIC SYSTEM USING CAN WITH CANAEROSPACE PROTOCOL
2	JALOVECKÝ Rudolf PAŘÍZEK Jiří	THE TECHNICAL DIAGNOSTICS APPLICATION IN AIRCRAFT INSTRUMENTS
3	PACES Pavel SIPOS Martin REINSTEIN Michal ROHAC Jan:	SENSORS OF AIR DATA COMPUTERS – USABILITY AND ENVIRONMENTAL EFFECTS
4	DUB Michal JALOVECKÝ Rudolf	UNIPOLAR PWM GENERATION UNIT FOR BTS780GP BASED DRIVER
5	JANŮ Přemysl BYSTRICKÝ Radek BAJER Josef:	PROPOSAL OF A TIME-TRIGGERED AVIONIC ELECTRICAL SUBSYSTEM USING CANAEROSPACE
6	JALOVECKÝ Rudolf JANŮ Přemysl	THE FEATURES MODEL OF A PILOT DURING OF DUMPING THE RAPID OSCILLATIONS IN AN AIRCRAFT
7	LABUN Ján ADAMČÍK František	RADIATION CHARACTERISTICS OF AIRBORNE ANTENNAS
8	REHANEK Peter	RELATIVE NAVIGATION IN AUTOMATIZED SYSTEMS

DEVELOPMENT OF THE AIRCRAFT ELECTRONIC SYSTEM USING CAN WITH CAN aerospace PROTOCOL

Rudolf JALOVECKY and Josef BAJER

SUMMARY: *A conceptual design of Aircraft Electronic System (AES) is introduced in the paper. The proposed AES will be developed by the participants of the Defence Research Project OVUOFVT200802. Basic requirement for the AES establishment is a data acquisition from all avionic sensors, systems and subsystems. Collecting of information can be executed only when partial data are available in the same data structures on the one particular onboard network. Based on previous research and development activities the industrial bus CAN with CAN aerospace protocol was selected for this purpose. The new AES conception is a fundamental step to implementation of the Network Enabled Capability (NEC) in aerospace. Functional samples of the systems will be created during the work on the project to verify the capability of proposed technologies.*

Keywords: CAN aerospace; Microprocessor; NEC; Information processing; Avionic system.

UNIPOLAR PWM GENERATION UNIT FOR BTS780GP BASED DRIVER

Michal DUB and Rudolf JALOVECKY

SUMMARY: *The paper deals with design of PWM driver for DC motor motion control. Basic requirements for PWM generation unit and its software design are explained. The basic element of the PWM unit is ADuC812 microcontroller which controls external digital counters. Special attention is focused on dead time control of the complementary PWM signals due to possible crossover currents. Generated PWM signals are delayed in logic circuits and then transferred to power module Infineon BTS780GP. The whole system is applied on Valeo 0273 GML type DC motor. Measured input signals of generated PWM and output signals of motor armature voltage and current are presented.*

Keywords: DC motor; Motion control; PWM driver.

THE FEATURES MODEL OF A PILOT DURING OF DUMPING THE RAPID OSCILLATIONS IN AN AIRCRAFT

Rudolf JALOVECKY and Premysl JANU

SUMMARY: *The paper deals with possible approaches to the creation of a replacement model of a pilot behaviour in process of control of an aircraft flight. The orientation is geared to the analysis of characteristics of a man in his attempts to curb the rapid vibrations of the aircraft. The article mentions the characteristics of a human-pilot from the perspective of part of automatic regulation. The characteristics of human in point of view of time of response to the complaint are crucial in this approach, thus the traffic delays and the effects of transient events - the time constants resulting from the training of human-pilot. An outline of possible shapes of transfer functions of human is shown, which may characterize his response to external stimulations.*

Keywords: Aircraft automatic control; Autopilot; Oscillation damper; Aircraft; Matlab; Simulink.

THE TECHNICAL DIAGNOSTICS APPLICATION IN AIRCRAFT INSTRUMENTS

Rudolf JALOVECKY and Jiri PARIZEK

SUMMARY: *Application of the methods and means of technical diagnostics in instrumentation were greatly limited in older types of aircraft. The article discusses the possibilities of technical diagnostics in the newly developed digital microprocessor controlled aircraft instruments. Two examples of successful implementation of the methods of technical diagnostics in the airplane L-159 ALCA instrumentation are given. There are principles of longitudinal balance indicator and fuel gauge briefly described in the article, furthermore applied diagnostic methods and tools and experience while placing these devices in operation as well.*

Keywords: Aircraft instruments; Diagnostics; BITE; TMR; Fuel gauge; Microprocessor.

PROPOSAL OF A TIME-TRIGGERED AVIONIC ELECTRICAL SUBSYSTEM USING CAN aerospace

Premysl JANU, Radek BYSTRICKY and Josef BAJER

SUMMARY: *The paper deals with an Electrical Subsystem (ESS) of the Avionic System (AS) proposal. The AS is designed to acquire and process flight data, as well as to provide them to the Network Enabled Capability (NEC) in aerospace. To serve as an on-board communication bus, Controller Area Network (CAN) with CAN aerospace protocol has been selected. The CAN is an event-triggered system, in which data transmission is driven by internal events in the bus nodes. A different time-triggered approach is described in the paper and new more flexible principle of data transfer scheduling is proposed.*

Keywords: Avionic System; CAN aerospace; Time-Triggered Approach; Network Enabled Capability.