Virtual cockpit,
computer-aided learning application,
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F-16 VIRTUAL COCKPIT – PROJECT OF COMPUTER-AIDED LEARNING APPLICATION – GENERAL MAINTENANCE PROCEDURES

Author, in this article, describes project of computer-aided learning F-16 aircraft maintenance application. This project consists of technical manuals and computer application. First part of the article contains general brief about purpose of the project. Second part is about operation of the computer application. Conclusions end the publication. This publication is integral part of author's scientific research about F-16 virtual cockpit project.

WIRTUALNY KOKPIT SAMOLOTU F-16 – PROJEKT KOMPUTEROWEGO WSPOMAGANIA PROCESU KSZTAŁCENIA PERSONELU LOTNICZEGO NA SAMOLOT F-16 – OGÓLNE PROCEDURY OBSŁUGOWE

W publikacji została przedstawiona część projektu wirtualnego kokpitu samolotu F-16 wykorzystywanego podczas komputerowego wspomagania procesu kształcenia personelu lotniczego. Projekt składa się z dokumentacji eksploatacyjnej i aplikacji komputerowej. W pierwszej części przedstawiono ogólne informacje o projekcie i jego przeznaczeniu. Druga część to zasada działania aplikacji komputerowej. Publikacja podsumowana jest wnioskami końcowymi. Artykuł stanowi integralną część prac badawczych autora.

1. INTRODUCTION

The most important factor in aviation safety is well-trained pilot. Ground simulation is primary element in modern pilot training. Aircraft technical development certainly increases requirements for young flying adepts. So far aging equipment like TS-11 „Spark" is used for practical training (on the ground and in the air) in Polish Air Force Academy. There is no advanced systems on board in this plane so basic theoretical and practical knowledge about up-to-date on board aircraft systems for military pilots' students needs to be provided. In the near future some of them will fly F-16 and this knowledge will help them faster and easier improve their flying skills.

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Described application is dedicated not only for Air Force Academy pilots' students but also for all the students who want to get familiar with operating F-16 aircraft on board avionic and armament systems (young pilots and technicians). Pictures describe operational ideas of the application work.

2. OPERATION OF THE PROJECT

Application is created in Macromedia Flash MX 2004 software (fig. 2.1). This part concerns all general maintenance procedures.
All information included in application comes from original F-16 Lockheed Martin pilots' and technicians' manuals and it is in English language only. The manuals consist of „step by step" maintenance procedures performed during avionic and armament system preparation. The application not only consists of preparation and checkout procedures but also describes all control panels and information displays used during maintenance. Students have opportunity to get information about the F-16 cockpit (F-16C single seat version) and improve technical English language skills.

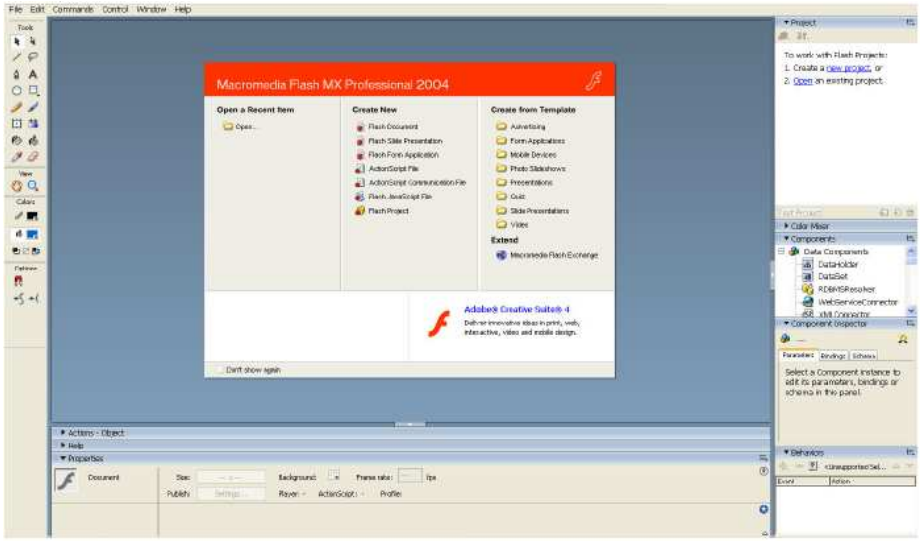

Fig.2.1. Macromedia Flash MX 2004 main window

Application is in *.exe" format and it can be open in any computer without additional drivers installed. Application start window is presented on fig. 2.2.

To go thru the procedure we need to click on „Start" box (fig. 2.2) and the application main menu window will be displayed (fig. 2.3). Next step is click on appropriate procedure. After that all important information and steps of the procedure will be displayed (fig. 2.4÷ 2.8).

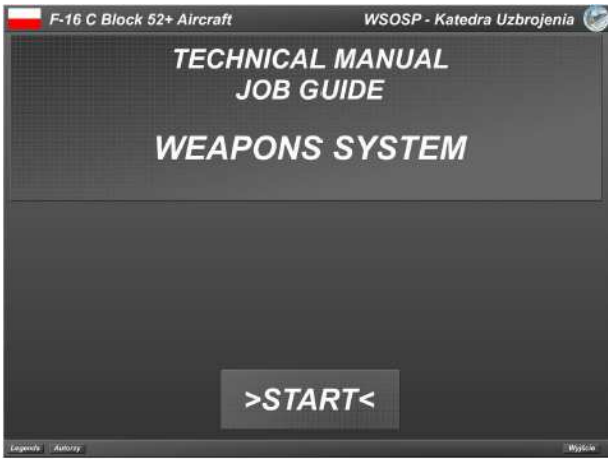

Fig.2.2. Application start window [3]

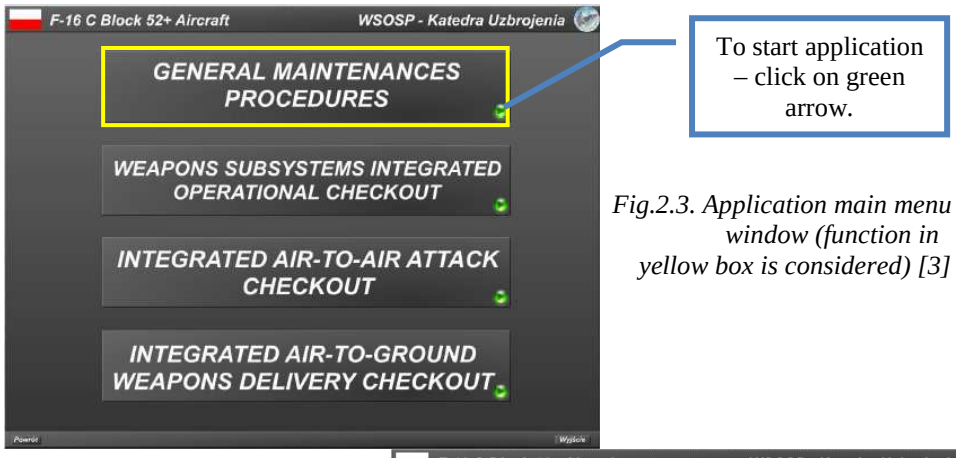

Fig.2.3. Application main menu window (function in yellow box is considered) [3]

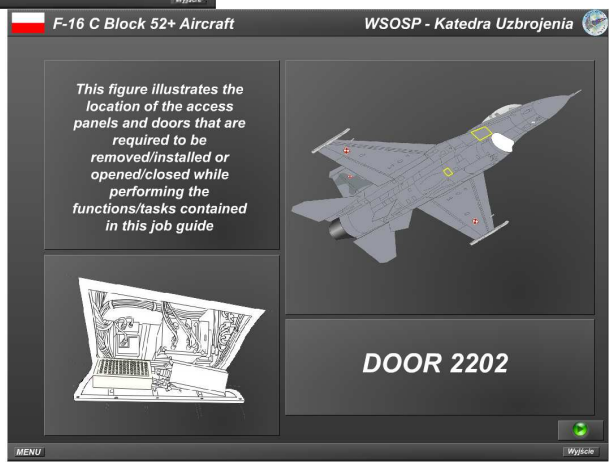

Fig.2.4. First information of the General Maintenance Procedures [3]

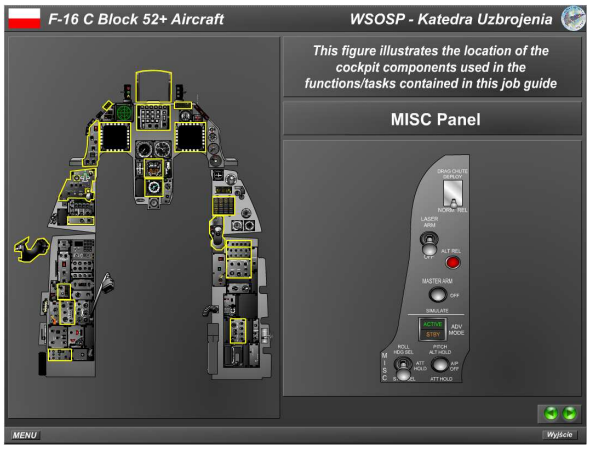

Fig.2.5. Next information of the General Maintenance Procedures [3]

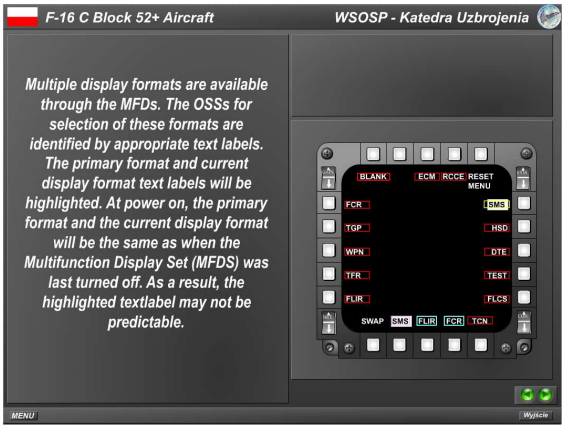

Fig.2.6. Next information of the General Maintenance Procedures [3]

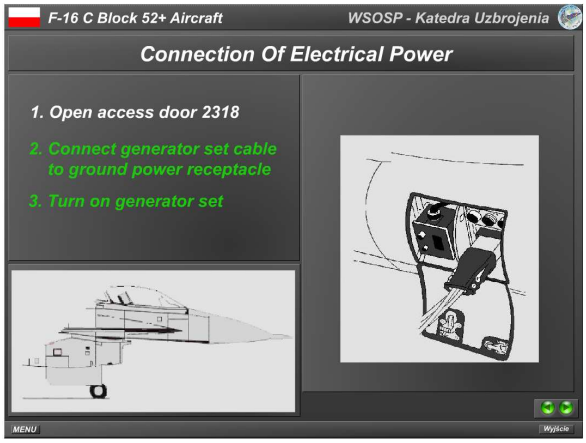

Fig.2.7. First step of the General Maintenance Procedures [3]

Clicking on „MENU" button in green box ends the procedure and displays application submenu window (fig.2.3).

Fig.2.8. Few next steps of the General Maintenance Procedures [3]

3. CONCLUSIONS

Well-trained pilots and appropriate skills level of ground staff personnel are crucial factors in aviation safety. For a last few years several tragic aircraft crushes happened. To avoid it or significantly decrease, training program needs to be improved, especially when instructors must deal with such technologically advanced aircraft as F-16. On board systems are very sophisticated so pilots must be licensed to proper level of flying skills and have technical English language certificates. Created application is a very useful and handy educational tool with the aid of young flying adepts can improve their knowledge about operating on board avionic and armament systems.

Next upcoming improvement of the application will be integrated A-A weapons checkout and Stores Management System (SMS) operational and functional checkout (in both aircraft version – F-16C and F-16D). After that all maintenance procedures of the F-16 C/D Block 52+ avionic and armament system will be complete. Moreover all cockpit panels and displays drawing will be replaced by photographs of the original equipment.

4. REFERENCES

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