

The following technical paper abstract information was recently submitted in connection with session DOD107,Inspection/Test

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Paper Title: Optical Micrometer Product Enhancement Adding Images; Report Generation; and Digital Data-transfer Functionality

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Abstract: 2014 Great Ideas Abstract

Optical Micrometer Product Enhancement Adding Images; Report Generation; and Digital Data-transfer Functionality

Existing Item: Digital Optical Micrometer P/N 8400K. NSN 6650 220 8942

MFR: J Chadwick Co Cage Code 65956. Made in USA

Applicable Technology Focus Area - "Inspection/Test"

Optical Micrometers are hand-held, portable instruments for measuring the depth of surface damage such as gouges and corrosion pits; thus they encompass Quality Assurance, MRO, Inspection and NDI. Performing repairs when damage is minor increases the aircraft mean time before failure (MTBF) and decreases the mean time to repair (MTTR).

Background

Optical Micrometers are CSE (Common Support Equipment) that have had NSN numbers for over 40 years; serving both Industry and the DoD. The depth of surface damage is difficult to measure by other methods. With the existing product, depth is read from a digital display and recorded with pen and paper; no images or depth data or reports can be captured or sent electronically.

Idea

The proposal is to add a camera, Report Page function, and electronic transfer of maintenance data. Reports from the field can be sent to distant engineers for analysis, or archived with other HUMS data. The goal is to assure that Optical Micrometers remain competitive and compatible in modern MRO environments.

Benefits: Safety, Cost-reduction, Readiness With the existing product, "repair or replace" decisions are made quickly and with certainty – reducing labor hours while increasing safety and readiness. The addition of imaging, report generation, and data-transfer will expand existing capabilities; and thus increase benefits accordingly.

Technical Approach

The idea involves the design and fabrication of a camera-based depth measuring device based on J. Chadwick Co.'s existing model 8400 Optical Micrometer. The resulting system will be in two parts: a small image acquisition unit (attached to 8400) for recording the images and depths of surface defects, and a laptop PC to assemble the acquired data into presentable reports.

The system will make use of commercially available processing and user interface (UIF) hardware that is found in smart phones and tablet computers. The model 8400 Optical Micrometer will be modified to accept a camera that is integral to the UIF.

#### Feasibility and Validation

J Chadwick Co has made prototypes with cameras, and has produced "Report Pages" (with images and depth information) which closely resemble the output of the proposed new device. As a result of this research, the company is confident that the upgrade is feasible, and will achieve the same accuracy and resolution as the existing product.

#### Presenter

Brigadier General Howard Yellen (retired); consultant of J Chadwick Co

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