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DECLASS REVIEW by NIMA/DOD

9 March 1966
Ref: LJC 406-1840

25X1A

Post Office Box 6788
Fort Davis Station
Washington, D. C. 20020

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Attention:
Contracting Officer

25X1A

Subject:

Gentlemen:

25X1A

In response to a request by your Technical Representative we are submitting herewith an Engineering Change Proposal (ECP-136-1) to incorporate certain electrical and mechanical features into the 70mm Data Block Reader being developed and fabricated for you under the subject contract.

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Enclosed herewith are three (3) copies of a technical document which describes in detail those wander corrections (electrical) and operator efficiency (mechanical) features which would be incorporated into this Data Block Reader. Also included herewith are three (3) copies of a Cost Breakdown Worksheet in the total amount of .

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Since delivery of the end item Data Block Reader is on schedule and will be accomplished by 30 April 1966, it is necessary that the contract be amended to authorize these technical changes at the earliest possible date.

We trust that this Engineering Change Proposal and the cost data associated with these changes as submitted herewith are complete for your evaluation. However, if any additional information is required, please feel free to contact me.

Very truly yours,

EXCLUDED FROM AUTOMATIC
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DOES NOT APPLY

ORIGINAL SIGNED BY

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Contracts

avw

Encs. 25X1A

cc:

P. O. Box 8031
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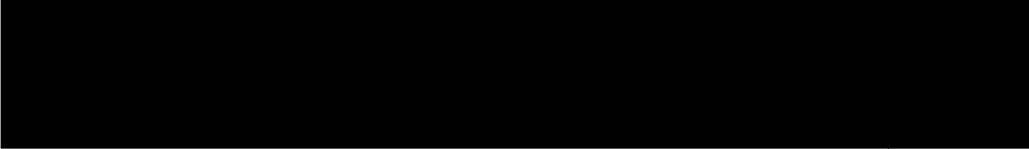
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ECP-136-1

Engineering Change Proposal

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70MM DATA BLOCK READER

STATINTL

Prepared By:



Approved By:

Section Manager

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1

INTRODUCTION

This Engineering Change Proposal has been prepared to describe the changes in scope requested to be included in the 70MM Data Block Reader

currently designed and developed by [REDACTED]

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New information concerning both the film format and the reader's operational requirements arrived at [REDACTED] subsequent to the submittal of proposal No. SME-CL-24, dated November 15, 1965. Evaluation of this information rendered the original approach less efficient than was originally calculated, and suggested a more suitable reading method.

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Since it was impossible to change approaches later in the contract period and still maintain the required quick reaction, the new solution was immediately implemented into the design and fabrication of the 70MM Data Block Reader. However, [REDACTED] was contracted to perform in accordance with proposal No. SME-CL-24, which comprises part of the contract, and the improvements that were incorporated in the design constitute a change in scope and require the additional funds requested in this Engineering Change Proposal.

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ADDITIONAL TASKS

The following paragraphs describe the additional tasks to be incorporated in the 70MM Data Block Reader under this Engineering Change Proposal.

2.1

WANDER CORRECTION

Drawings showing the laydown mechanism of the data block indicate that the format and the data block are recorded in two different stations, resulting in format wander of .046" independent of block wander of the same amount. In addition, a static error of .030" in block location may occur due to mask positioning tolerances. As a result, the data block may fall partially into the format, or partially out of the film edge.

In most cases, however, only one of the variables - block and format - is recorded in its worst wander condition, or they may both wander in the same direction. For example:

- a) The block is recorded in its nominal position, or above it, but the format has wandered to its uppermost position. The dots do not fall in the format.

- b) The block is recorded in its lowest position, but so is the format. Again, the dots are not in the format.

The original approach called for fixed, wide diodes, as the reading elements. If these diodes are made wide enough to cover the block's worst case wander, the lower diode will protrude into the format in example (a), mistake it for a dot and perform an erroneous reading. If the diodes are made narrower, so that they skirt the edge of the format's uppermost position, the block in condition (b) will be missed, since the index dots will be below the edge of the lower diodes.

Other examples involve an ambiguous strip between the two rows of dots, where the upper row may be sensed by a lower diode (and vice-versa) if the gap between the diodes is narrow, or a dot may fall into a gap between two diodes and be missed altogether if that gap is wide.

Under the proposed change, the read heads will consist of 14 diodes .018" each. The leading head will sense the position of the dots in the upper row, and based upon this information, the logic will activate only the diodes that are located around the actual position of the rows in the data block. A group of adjacent activated diodes will effectively perform as a single wide diode, similar to that in the original proposal,

except that by pre-sensing and switching the outputs of the diodes into variable clusters, the heads will effectively float up and down together with the data rows.

The basic difference between the two reading methods is that rather than opening a wide aperture to accommodate for maximum data block wander as originally proposed, the new approach will let the nominal size aperture wander together with the block. This solution requires 24 additional read amplifiers and the associated sensing and switching logic. It is also the major cause for increased reading reliability and lower error rate.

2.2 OPERATOR EFFICIENCY

To increase the operator's efficiency, it was requested that the following modifications be made in the transport design.

- a) The operator will control the reader from a sitting position. This requires mounting the film transport on a vertical plate rather than a table top base, as well as an optical assembly consisting of two lenses and a beam splitter to project the block image to the operator's eye level.

- b) Addition of manual cranks on the film reels to enable manual transportation of the film.
- c) Addition of facility to stop the film before the next frame. This required addition of heavy duty brakes on the film reels.
- d) Automatic stopping on detected errors.

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