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CONFIDENTIAL

30052

NPIC/TSG/ESD/TEB-124/71
31 August 1971

MEMORANDUM FOR THE RECORD

SUBJECT: Temporary Vibration Fix for the [redacted] 1540 Light Table

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1. On 21 July 1971, [redacted] IEG, solicited the aid of ESD to alleviate the effects of vibration on the [redacted] 1540 Light Table. [redacted] is currently working on a permanent solution to the problem but their results will not be available for several months. [redacted] was hoping that ESD could provide some aid in the meantime. Contained herein are the results of ESD's efforts.

25X1 25

2. [redacted] IEG, was selected as a PI with more than average vibration problems with his [redacted] 1540 Light Table. He was questioned to insure that he had followed all recommendations to minimize vibrations (i.e., a slight tilt to the table, table close to building column, and operator not in contact with table during high magnification operations). [redacted] then indicated that he was most aware of vibration when he was studying a particular image for an extended period of time. An obvious solution in this case would be to provide direct coupling between the microscope's objective and the film stage. A wedge was glued to the top surface of a hold down ring and when vibration-free viewing was desired the wedge was placed in contact with the rhomboid arm. All image motion was stopped at the expense of convenience and maneuverability. This solution is completely unacceptable for scanning operations.

25X1 25

The next approach was to provide isolation of the entire table from the source of vibration. Isolation pads were placed under the wheels of [redacted] light table. Although [redacted] is satisfied with this solution, most other PI's are not. Isolution pads, flexible enough to attenuate 15 Hz frequencies, also cause the table to sway freely. In addition, any contact with the table, bypassing the isolation pads, causes vibrational motion to continue.

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Declass review by NGA/DoD

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The next approach was to stiffen the bridge beam. Theory states that a "closed box" beam is more rigid than a "C" beam. An idealized case would be to replace the "C" beam. This is the solution that [redacted] has chosen. A compromise to this solution is to close the beam only part way. By clamping a 3/8" aluminum plate to the open side of the bridge beam, vibrational image motion is reduced significantly. This solution appears to solve vibration problems with a minimum amount of additional limitations created. Three vibration attenuation kits have been fabricated and are being used by PI's in IEG. (Section 3) describes the kit and discusses its operational limitations. 25

3. The vibration attenuation kit consists of one aluminum plate (9" x 5" x 3/8") clamped to the microscope carriage bridge beam either on the left hand or right hand side. The plate is fastened to the beam by four "C" clamps. Figures 1 and 2 show the kit attached to the right hand side of an [redacted] 1540 Light Table. Attachment of the kit does not require any permanent alterations to the existing light table. 25X1

The only limitation to this solution is the reduction in surface area the microscope can cover. The addition of a 9 inch plate to the right hand side of the bridge beam restricts the carriage assembly to 5 inches of travel to the right from center. A 9 inch plate, attached to the left hand side, restricts carriage motion to 5 inches left of center. The area of the viewing surface used by the PI is a function of which hand he writes with. A right handed PI normally uses the left hand side of the viewing area for monoscopic viewing and the center for stereoscopic viewing. The right hand viewing area is used as a writing surface. A left handed PI is just the opposite. There has been very little complaint by PI's who have the kit attached to their table. The only complaint was by a PI who had a little trouble using his grid overlay. He was able, though, to adjust the imagery such that he could use the grid. The overall impression of those PI's involved is that they would gladly give up viewing area, seldom used, to stop image motion.

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4. This solution to the vibration problem is offered as a temporary fix until [redacted] makes their more rigid bridge beam available. It is, however, possible that this temporary fix will be an alternative to the [redacted] fix should the [redacted] fix prove to be not economically feasible. ESD will supply design drawings and additional information for those who are interested.

[redacted]

Test Engineer
TEB/ESD/TSG/NPIC

Distribution:
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1 - NPIC/IEG/OD/Ch
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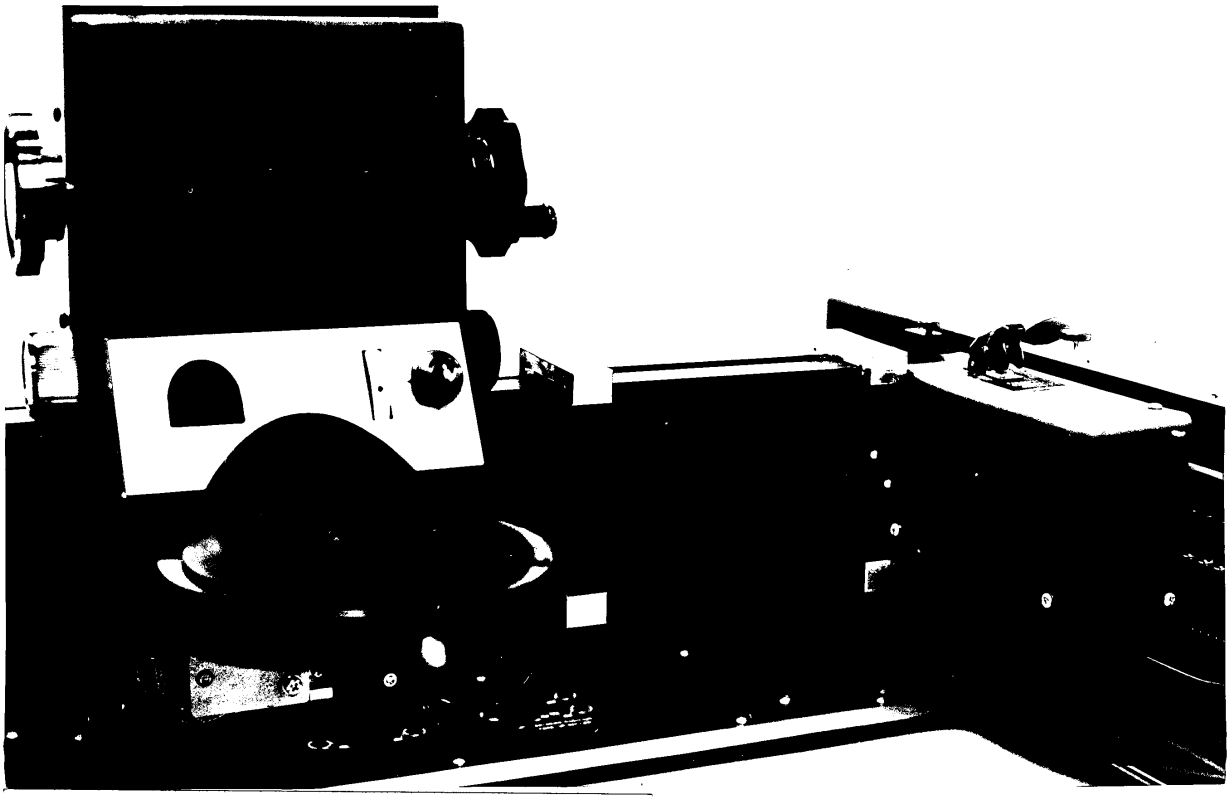

Figure 1: Front view of an [redacted] 1540 Light Table with a Vibration Attenuation Kit attached to the right hand side of the carriage beam.

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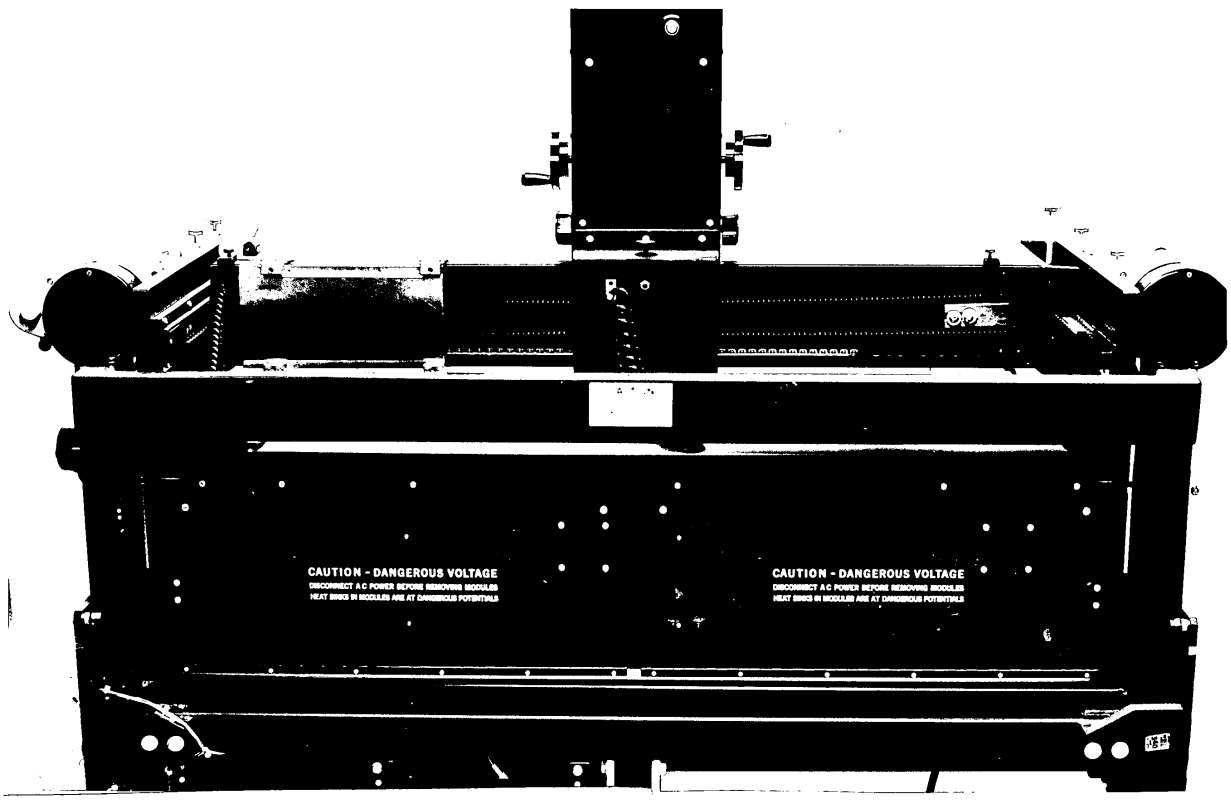

Figure 2: Rear view of an [redacted] 1540 Light Table with a Vibration Attenuation Kit attached to the right hand side of the carriage beam.

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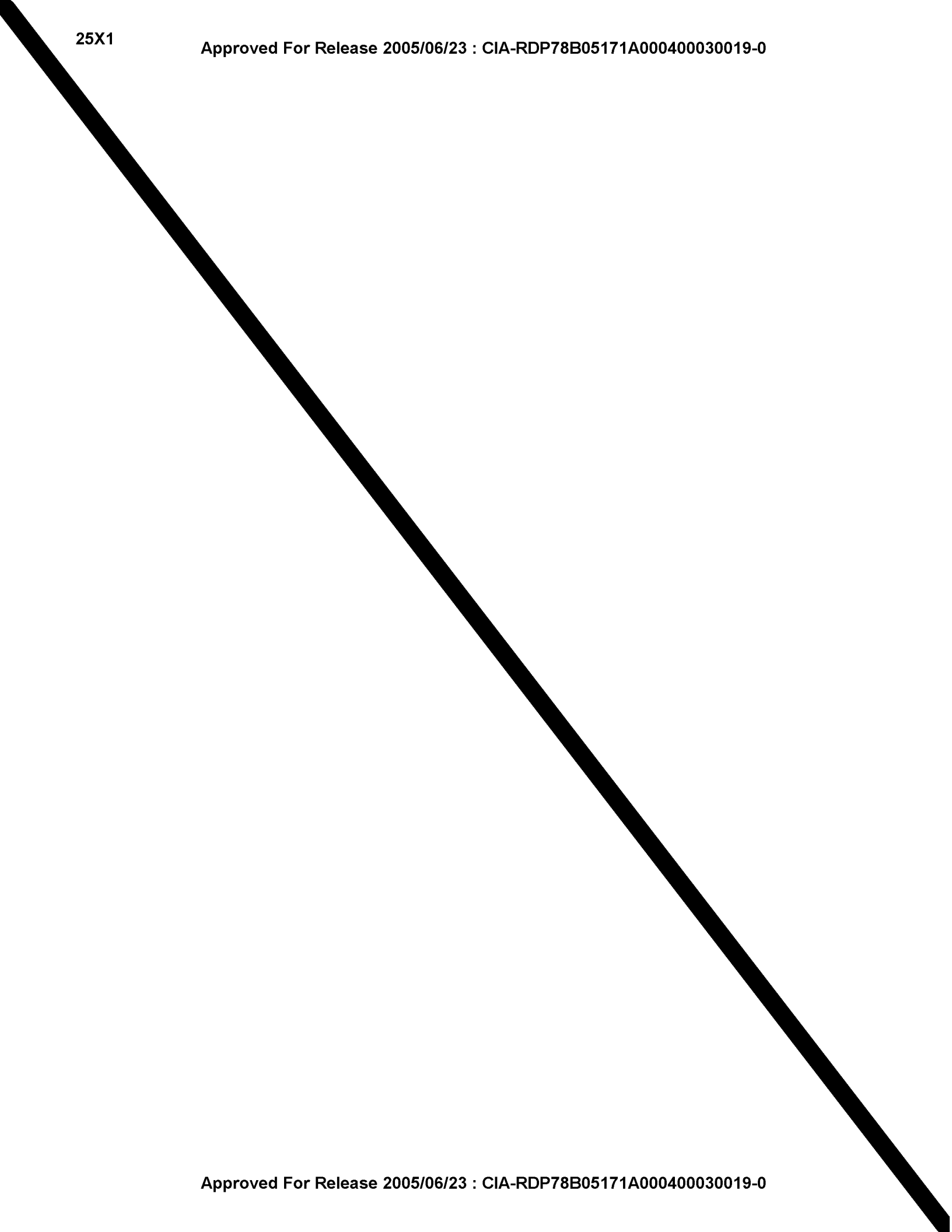

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