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15 September 1967

SUBJECT: Report of Trip to [redacted] Washington, D.C.,
7 September 1967

25X1

REFERENCE: Report of Telephone Conversation, [redacted]
15 August 1967

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PURPOSE: Observation and Discussion of Problems Concerning the Prototype
Briefing Print Enlarger (PAR 243A, Contract [redacted])

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CUSTOMER PERSONNEL CONTACTED:

[redacted]

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CONTRACTOR PERSONNEL:

[redacted]

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DISCUSSION

1. In the morning a conference was held in which the items in the reference telephone conversation were discussed in detail. The afternoon was spent investigating problems on the Prototype Briefing Print Enlarger, and a second conference was held to discuss what action, if any, might be desirable or necessary in connection with each of the problem items below.

2. The following is a resume of the discussion and conclusions with respect to each item.

a. Item 1 - Refractive Index Immersion Fluid

(1) The customer expressed strong preference for an immersion fluid of his own formulation rather than the tetrachloroethylene supplied with the machine. Customer experience indicates that their formula exhibits less tendency toward air bubble formation in the gate. There was some uncertainty with respect to the details of their mixture, but the consensus

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was that it was a half-and-half mixture of tetrachloroethylene and trichloroethane. This mixture is similar but not identical to that which the contractor has been recommending for 10, 20, and 40X Enlarger use. The tetrachloroethylene which the contractor has been using and supplying is stabilized with ethanol. That which the customer is using is ethanol free to the best of their knowledge. [redacted] customer development engineer, believed that the air bubbles were "absorbed by the fluid" better with their mixture. It may be that the mixture has better emulsion wetting properties than the tetrachloroethylene.

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(2) The customer was encouraged to use his own mixture as long as he was satisfied that no emulsion deterioration was resulting. The contractor stated that customer observations were of considerable interest and that attempts would be made to learn more about the problem.

b. Item 2 - Fluid Injection into Gate

(1) In order for the fluid gate to operate properly, a sufficient quantity of refractive index immersion fluid must be injected on each side of the film in the partially closed gate. The gate and its associated hardware was designed to maintain an open pocket between either glass and the film to facilitate this injection process. The customer encountered a situation with curled film and with the top edge of the film below the top of the gate. Because the curled top edge of the film contacted the stationary gate glass, the customer was unable to achieve proper fluid gate operation without manually restraining the top edge of the film during fluid injection. This he was willing to do; however, the slot width in the vapor shield reportedly placed a limitation upon finger access and film motion. This led to the request in the reference telephone conversation for "redesign of the two metal plates on the vapor shield, etc."

(2) An investigation of the above complaint was made. The contractor's representative operated the machine under a variety of film positions in the gate. Difficulty was encountered when the curled top edge was positioned below the top of the gate. However, it was found to be a relatively easy matter to circumvent the difficulty by restraining the top edge of the film with the tip of the index finger. The vapor shield slot was found to be wide enough to permit this.

(3) Further discussion showed that proper operation of the fluid gate, including the elimination of bubbles, was considered of utmost importance to the customer. Although it was agreed that the customer can now operate the prototype as it stands, the contractor was strongly encouraged to find a mechanical means of holding curled film for proper fluid injection.

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(4) Although the contractor agreed that this was desirable, it was pointed out to the customer that any redesign at this time might affect delivery of the units in process. It was finally agreed that the contractor would try to design a fix and have sample hardware ready for try-out during in-house testing of the first production unit. A reasonable delay in delivery of the first unit is to be expected and will be acceptable. When it becomes feasible to do so, the contractor will inform the customer of any cost and delivery changes made necessary by this redesign. Assuming that the redesign will be successful, this effort will include a retrofit of the prototype, serial number 001.

c. Item 3 - Larger Crank (Knob) on the Lamphouse

25X1 (1) [] suggested increasing the working radius of the crank which operates the lamphouse-gate closing mechanism. The contractor's representative explained and demonstrated that the crank handle on the knob was designed to facilitate rapid motion of the gate during non-critical portions of the closing and opening operation and that it was intended that the knob be used as a hand knob during that portion of the closing excursion which required greater control.

25X1 (2) [] agreed with [] that a larger knob would be preferable. It was agreed that the contractor would look into the matter, and if a direct substitution of purchased knobs could be made without delaying delivery, this would be done.

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d. Item 4 - Redesign of the Permanently Mounted Gate Glass in the Lamphouse for Easy Removal to Clean or Replace

(1) This problem was discussed at considerable length. The contractor's representative then demonstrated how this glass can be cleaned in position. It then appeared that the customer's primary problem was replacement, which apparently had caused scratches and pits in the glass. A careful examination of the gate glass on the prototype lamphouse revealed several vertical scratches about 1/16-inch long neatly arranged in a horizontal row about 1/2-inch from the bottom edge of the glass. There did not appear to be any mating scratches on any of the lens gate glasses. The origin of these scratches is unknown. The immersion fluid nearly causes them to disappear, and they are outside the usable field of the three higher magnification lenses. In the final discussion, it was pointed out by the contractor that redesign of the magnitude necessary to make this glass easily removable would be costly in both time and money. Delivery of follow-on units would almost certainly be delayed several months.

(2) It was further pointed out that there is no good basis upon which to predict the life expectancy of these glasses. Intuitively, one would expect several months or years of operation, barring accident, without changing gates. It was agreed that a redesign of this item is not warranted at this time.

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e. Item 5 - Redesign of the Condenser Lens Mounts to Allow Easy Removal for Cleaning

(1) Considerable discussion and an examination of the Prototype Briefing Print Enlarger condensers revealed that a reasonable amount of dirt on the condenser elements will probably not constitute a bad situation. In the case of the longer-focal-length projection lenses, it is possible that large dirt particles on the condenser system surface nearest the gate might be discernible on the easel. These surfaces are readily accessible for cleaning.

(2) After considering the cost and delivery delay involved, the risk of reversing some elements, the possibility of degrading condenser system performance by going away from permanent precision mounts, and the possible consequences of altering heat transfer characteristics of the existing, successful system, it was agreed that redesign did not appear desirable.

f. Item 6 - Redesign of the Two Metal Plates on the Vapor Shield

(1) The customer suggested widening the slot through which the film passes when being lowered into the gate to the printing position. The purpose of this was to permit fingertip manipulation of the film upper edge to facilitate the fluid injection process.

(2) It was pointed out to the customer that it is not desirable to alter the slot width because of the possibility of adversely affecting air flow over the film during the fluid drying cycle. Further, the real problem is not the slot width, but rather to get the fluid into the gate and to get the bubbles out under all circumstances. When this is accomplished, the very occasional need to touch the film should not require a wider slot.

g. Item 7 - Flyaway Spare Parts Kit

25X1 [redacted] asked for the status of the kit for the Prototype Briefing Print Enlarger. It is complete and will be shipped by 15 September except for those parts which are due from Macbeth for the Photometer.

h. Item 8 - Parts for the RT-12

25X1 [redacted] also requested information on parts for the RT-12.

ACTION ITEMS

3. Contractor effort shall consist of the following:

a. Study design change to overcome the problem of curled upper edge of film in the gate.

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If redesign appears feasible, the customer will be informed of any cost and delivery changes effected by this redesign. Included will be a retrofit of the prototype, serial number 001.

b. Investigate the availability of a directly interchangeable knob (Item 3 above). If feasible, supply larger knobs on all undelivered units, and supply the customer with a larger knob which he has agreed to retrofit to the prototype, serial number 001.

c. Furnish information to [redacted] concerning the RT-12 parts.

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4. The contractor shall deliver the Flyaway Spares for the prototype Briefing Print Enlarger to [redacted]

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