

. . PROGRESS REPORT

For

VERSATILE, HIGH PRECISION STEREO

POINT TRANSFER DEVICE

Period Covered: November 1965
Dated: 15 December 1965
Job No.: #552, #552A
Document No.: OD-270

DECLASS REVIEW by NGA

552 - OD-270

PROGRESS REPORT
For
VERSATILE, HIGH PRECISION STEREO
POINT TRANSFER DEVICE

Progress Report 552 & 552A for November 1965

This month we have completed miscellaneous updating assembly work, readying 552 A # 102 for shipment and examining some problems on the 552 optics.

OBJECTIVE HEAD

The approach to improve color in 552 optics by laser wavelength shift and beamsplitter change has been more thoroughly searched out. A quotation and transmission curve for reworking beamsplitter cube has not been received although the only interested vendor has assured us that image and dot, color and transmission performance can be decidedly improved over previous beamsplitter.

During the course of adjusting the 552 optics a problem was noticed preventing visual observation of point mark without seriously changing point mark size. The problem appears to be when the relay lens used to transmit target to objective lens is working very near 1:1 and its focal length is slightly shorter than desirable. Physical limitations surrounding the relay lens prevent placing it at the correct location. General alternatives, such as changing reticle size and location, and relay lens, are being studied for solutions.

ENCODER - COUNTER SUBSYSTEM

Problems regarding encoder installation on the 552 #101 have been discussed with the customer. proposal

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25X1 was submitted to conclude work on this section. It is important to the system delivery that approval of this proposal be received by before 1 December because components and work to complete the area will take at least (6) weeks.

At the customer meeting November 4, 1965 the following was decided:

1. Place CMC control panel on small sloped-front cabinet mounted on side of larger rack cabinet with arm allowing small cabinet to rotate in horizontal plane and to be at a convenient angle (over right hand side of joystick mechanism) for operator's use.
2. Counter, display, synchronizer and switch panel to be placed in 50 inch high cabinet on casters. Location of units in rack has been decided. Layout of switch panel and associated electronic modules and connectors has also been worked out.

System checkout of the 552A #102 went smoothly, with no unusual problems; we achieved a slight improvement of the scanning synchronization over the previous system. As before, the system will be run during acceptance with test bed glass platens that will be replaced at installation. To reduce delay between acceptance and shipping we have arranged for equipment transportation December 7.

Work for Next Reporting Period

- 1) Continue debugging 552 #101.

Enclosures

- 1) Customer review CD-139.
- 2) Financial Report

File 997023

PROGRESS REPORT
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Period Covered: October 1965
Dated: 9 November 1965
Job No.: #552, #552A
Document No.: OD-266

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PROGRESS REPORT
For
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POINT TRANSFER DEVICE

This month we have almost completed updating assembly motions for the 552 and 552A, with the remaining work installing minor parts of the vacuum holddown mechanism, glass platens, and completing objective assembly turret lens centering and field lens installation.

OBJECTIVE ASSEMBLY

Work on 552 objective heads and point marking optics is underway to settle this problem area. There has been positive response from only one vendor who was kind enough to check the present dichroic beam splitter and proposed that some improvement is possible with better centering of laser reflection band about laser wavelength, broader visible transmission region removing transmission cut off in blue end. However, the fundamental need of very narrow reflecting band at laser wavelength has not been met. A possible alternative could be to shift laser wavelength sufficiently out of visible spectrum, say to 1.06 micron, and alter dichroic accordingly. However, problems of this change would have to be searched out in further analysis and experiments with system. Since the dot reticle would then have no reflective means in the cube for visible light an arrangement with a second reflective surface in the cube would have to be made, possibly like the semi-reflecting film used in the 552A. However, this film would have to be modified to prevent reflection at laser wavelength, and therefore, avoiding a "ghost". Aside from optical considerations, modification of laser system will be required to assure required output and repetition rate.

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Optical adjustment of eyepiece and objective assemblies are nearly complete on Stereo Viewer to be shipped next.

System checkout is expected to be completed during next reporting period. It is also expected that equipment delivery may be possible by end of November. Customer acceptance motions should be contemplated for that period.

ENCODER - COUNTER SUBSYSTEM

Meeting with customer has been arranged for early November to make decisions regarding equipment needed to complete encoder installation on 552 system.

Work for Next Reporting Period

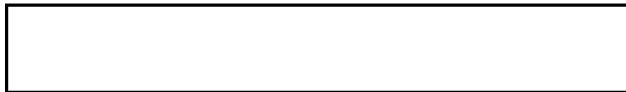
- 1) Complete updating of all machines.
- 2) Complete debugging, acceptance work for 552A #102, prepare to ship.
- 3) Continue debugging 552 #101.

9 November 1965
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WWB:rf

CUSTOMER REVIEW

DATE: 29 October 1965

ATTENDEES: P.L. and ED



1) 552 Glass Platens

What has been done to implement removal of macro-grooves? We stated nothing has been done to improve problem because of financial limitations of project.

2) Troubles with 552A #101 so far:

Center holddown spring edge came loose from arm, customer cemented in place.

Short length of 9 1/2 inch film would not holddown, apparently because of leak at read holddown and that it could not be tensioned properly.

Otherwise, system is running satisfactorily and meeting customer's needs.

3) Submitted informal quotation for image alternator and film drive assist. We will send a letter proposal soon describing the latter more fully, and confirming image alternator prices.

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Period Covered: September 1965
Dated: 12 October 1965
Job No.: #552, #552A
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PROGRESS REPORT
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POINT TRANSFER DEVICE

Work this month has been to update assembly of Point Transfer Device and companion Stereo Viewers. Assembly and modification phases should be completed during next reporting period while final optical and electrical adjustments are in progress on machine to be shipped next, 552A #102. Because of the large number of adjustments required, schemes and tools are being standardized to get uniform and optimized performance in the end products. Emphasis has been placed on procedures and equipment that permit adjustments to take place on the machine rather than in the laboratory so that installation and servicing requires the least possible disassembly of a system.

OBJECTIVE ASSEMBLY

The Objective Assembly optics in the Point Transfer Device are in their preliminary adjustment stage. One problem observed is the blue-green color given the image by the dichroic film in the beam splitter used to put the laser imagery on the optical axis. Since there was great concern in the past about the color seen at the open gate illumination, improvements to reduce filtering of visible light will be investigated. The problem is to obtain sharp division between highly efficient reflection for the laser (infrared) light path and high transmission with the visible light that is not reflected. Because the filter reflects more visible red light than desirable, the image has a

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blue-green character. Opposing this goal is our problem to find an arrangement to eliminate ghosts and image distortions. For example, a piece of glass arranged at 45 degrees to the optical path with a specimen dichroic coating on one side, and anti-reflective coating on the other, may exhibit sharply defined IR reflection properties but introduce a ghost and some astigmatism. The cube eliminates the latter, but blurs the reflection properties. One solution may be to separate the members of the beam splitter slightly, allowing a minimum of ghost spacing and astigmatism, and creating a film-air interface improving IR reflecting properties.

ENCODER-COUNTER SUBSYSTEM

In setting up the customer supplied equipment to check-out the encoders on the Point Transfer Device, several "missing links" were noticed that prevented mating of counter to encoder; i.e., the switches to reset and preset, and an electronic element to shape and amplify signals from the encoders. The switches are a panel layout oversight and can now only be placed on another panel, preferably near the counter electronics. The pulse shaping network, electronic module 15-EL-44, is to be customer supplied equipment. Two shortcomings are noticed: power supply capability provided by the counters for this network has less output on some of the voltage levels specified for the 15-EL-44, and module pulse output is one half specified width that counter requires for reliable operation. In spite of these, customer tells us system will work safely and reliably. We then are proceeding to check out encoders, install in temporary rack, mount panel switch, and will advise customer of type and length of cables required on system for encoder connection.

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It is suggested that the four (4) required electronic modules be rack mounted to simplify installation and interconnection, and should be forwarded to use for above work during the next reporting period.

Work for Next Reporting Period

- 1) Complete updating assembly work of all machines.
- 2) Continue final adjustment and debugging 552A #102.
- 3) Commence final adjustment 552 #101.