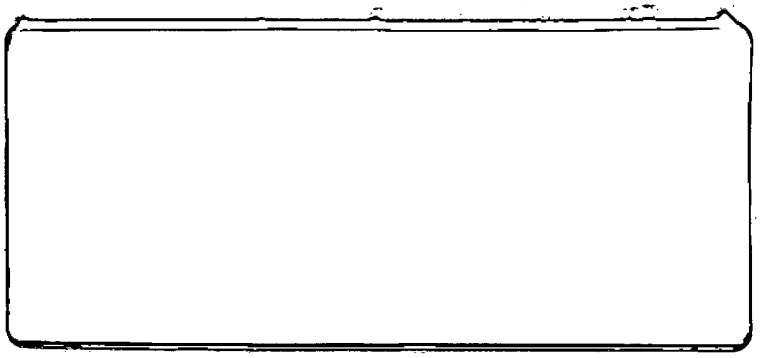
File Copy
1103F



STAT

STATUS REPORT

for Period

1 SEPTEMBER through 30 SEPTEMBER 1969

U.S. Government

STAT

File No. 11038

STAT

This document is presented as the Monthly Status Report under Contract to the U. S. Government, [redacted] STAT
The report period represented herein covers the period 1 September through 30 September, 1969.

[redacted] STAT

[redacted] STAT

INDEX

Index (cont'd)

APPENDICES

STAT

PROGRAM SUMMARY

Scheduled Percentage of Completion	79.2%
Actual Percentage this Date	71.7%

During September a monitoring visit was made to [ ] by the Contracting Officer's Technical Representative for the purpose of reviewing the program status. STAT

The performance of the Stereocomparator fabrication program is proceeding normally and with no schedule changes affecting the critical path.

A visit was made to [ ] by the customer's Technical Representative concerned with instrument maintenance. During this visit it was recommended that a minimum number of spare parts items requiring a long lead for procurement be ordered as soon as possible. This was specially with reference to certain optical parts subject to catastrophic failure. STAT

During September, the [ ] (Image Analysis equipment subcontractor), slipped their acceptance testing commencement schedule from September 8, 1969, to October 6, 1969, and then to October 27, 1969. STAT

This is a very unsatisfactory situation, however the overall schedule of the Stereocomparator is not affected at this time.

Strong representation is being made to [ ] in an attempt to arrive at a firm schedule for their work. STAT

TASK 1

STATEMENT OF WORK, SPECIFICATIONS, REPORT PREPARATION

Scheduled percentage of completion	84%
Actual percentage this date	84%

No new specifications were developed or issued during this report period.

Monthly reports from our subcontractors are incorporated into this document under appropriate task headings or in the Appendix.

TASK 2

SCHEDULING AND PLANNING

Scheduled percentage of completion	84%
Actual percentage this date	84%

A revised PERT chart has been prepared showing the schedules for the various tasks that are anticipated through July, 1970, and is included as Appendix II to this report.

There are no fundamental changes in the overall program and the completion date remains the same.

TASK 3

TEST AND INSPECTION PROCEDURES

Scheduled percentage of completion	74%
Actual percentage this date	58%

Work is continuing on the tests and procedures related to the optical subassemblies.

Declassified in Part - Sanitized Copy Approved for Release 2012/08/24 : CIA-RDP79B00873A001400010010-8

TASK 4

MANAGEMENT, ADMINISTRATION AND SUPERVISION

Scheduled percentage of completion	84%
Actual percentage this date	84%

Management and administrative functions are proceeding normally with the work effort directed primarily to the coordination requirements of the optical subcontract.

TASK 5

MEETINGS

Scheduled percentage of completion	84%
Actual percentage this date	84%

A meeting was held with the customer representative during the week of September 8th, during which certain details of the output interface to the central computer facility were discussed and clarified. In particular, the logic voltage levels and modes of operation were discussed and the transmission line characteristics between the Stereocomparator equipment and the central computer facility were established.

The Teletype interface to the customer's equipment was also discussed, (the ASR 35 Teletype unit incorporated in the Stereocomparator is shared between the Stereocomparator computer and the central computer facility). The logic levels and mode of operation (full duplex) were established as well as the transmission line characteristics. It was found that the Teletype unit purchased with the Honeywell DDP 516 computer used in the Stereocomparator did not include an"ALT MODE" key.

The Stereocomparator system does not use this particular key although the customer data transmission system does and it was

agreed that, since the customer has the necessary parts for installation of this key available in their plant facility, they would make the installation after delivery of the instrument to the customer's site.

Declassified in Part - Sanitized Copy Approved for Release 2012/08/24 : CIA-RDP79B00873A001400010010-8

TASK 6

FACILITIES REQUIREMENTS

Scheduled percentage of completion	98%
Actual percentage this date	92%

An analysis of the clean room system has demonstrated that the electric heaters, for reheating and temperature control of the air conditioning system, were inadequately sized.

Larger heaters have been ordered to correct this condition.

A high sensitivity recording thermistor thermometer has been purchased for use in determining the stability of the clean room air temperature. This will allow [redacted] to optimize the ambient air conditions for the Stereocomparator, with particular reference to the testing program. STAT

TASK 7

MAIN FRAME AND STRUCTURAL ELEMENTS

Scheduled percentage of completion	98%
Actual percentage this date	93%

The main frame for the Stereocomparator was completed in September, 1968.

No additional work will be scheduled for this Task until the return of the Optical Bridge by the optics sub-contractor.

TASK 8

SKIN

Scheduled percentage of completion	78%
Actual percentage this date	30%

The fabrication of the external skin sections has been completed to the point where the total assembly is needed in order to finish this Task.

No further work is anticipated until the Stereo-comparator has been completely assembled.

Declassified in Part - Sanitized Copy Approved for Release 2012/08/24 : CIA-RDP79B00873A001400010010-8

TASK 9

GRANITE AND WAYS ASSEMBLY FOR STAGE

Scheduled percentage of completion	98%
Actual percentage this date	98%

No further work is anticipated on this Task at this time.

TASK 10

AIR BEARINGS

Scheduled percentage of completion	98%
Actual percentage this date	96%

The original air bearing filters leaked high pressure air to the atmosphere and suffered frequent rupture of the filter elements.

New filters of [ ] design and fabrication have been installed and on the basis of the limited experience with their use, appear to be fully satisfactory. STAT

TASK 11

STAGE DRIVES

Scheduled percentage of completion	98%
Actual percentage this date	78%

The installation of the new air line filters (Task 10) has been completed and preliminary testing of the stage drive assemblies has begun.

Phasing of the various safety limit switches has been accomplished although it was found necessary to mechanically relocate some of these limit switch assemblies due to interferences at the extreme limits of stage travel.

The 23-bit digital-to-analog converters, which are used to convert the computer signals into voltages suitable for driving the servo amplifiers, have been tested under computer control and are satisfactory.

Measurements of the breakaway torque and running friction have commenced; also, the design of the velocity feed back loop is proceeding.

TASK 12

FILM DRIVE AND TRANSPORT SYSTEM

Scheduled percentage of completion	98%
Actual percentage this date	70%

Testing of the film drive and transport system is continuing and no significant difficulties have appeared.

It was found that the limited resolution of the joy-stick film slewing control does not permit operation of the film transport at sufficiently low velocities to allow proper film positioning on the platen. This problem is under review.

Final chassis cleanup and testing has been performed and the adjustment of the system with the pneumatic lift-off and vacuum clamping apparatus will begin shortly.

Declassified in Part - Sanitized Copy Approved for Release 2012/08/24 : CIA-RDP79B00873A001400010010-8

TASK 13

FILM PLATEN AND FILM CLAMPING

Scheduled percentage of completion	98%
Actual percentage this date	92%

Checkout and test of the system is proceeding.

TASK 14

FILM COOLING

Scheduled percentage of completion	98%
Actual percentage this date	60%

There will be no further work on Film Cooling until the optical system arrives.

TASKS 16, 17 & 18

VIEWING OPTICS, VIEWING ILLUMINATION,
RETICLE PROJECTOR and ILLUMINATION

Scheduled percentage of completion	97.5%
Actual percentage this date	90%

Correspondence with the optical vendor [redacted] STAT has indicated that their optical subassembly tests are showing success in meeting and exceeding the expected performance specifications.

They are presently starting optical tests with individual subassemblies combined into systems.

[redacted] is presently reviewing the electromechanical STAT interface with the optical system to be sure that the final assembly will be properly coordinated.

TASK 20

GENERAL PLATEN ILLUMINATION

Scheduled percentage of completion	98%
Actual percentage this date	86%

The platen illumination equipment has been installed on the Stereocomparator and has been tested. The units performed satisfactorily under the specified range of illumination and appear to cause no radio frequency interference in the system. This Task is therefore substantially completed.

TASK 21

OPTICAL BRIDGE AND SUPPORTS

Scheduled percentage of completion	98%
Actual percentage this date	98%

No further work is scheduled until receipt of the optical bridge and the optics from subcontractor.

TASK 22

INTERFEROMETER ASSEMBLY

Scheduled percentage of completion	96%
Actual percentage this date	70%

Tests have begun with the Interferometer system although definite measurements cannot be made until the [redacted] STAT clean room temperature control system is fully satisfactory.

The optical wedge units in the photo field effect transistor assemblies, which had corroded, have been repolished and coated and are ready for use.

It has been found that some wiring problems exist in the cable assemblies between the laser power suppliers and the laser plasm tube assemblies proper.

In particular, a 120 hertz spike has been found in the servo correction feedback signal which is used to control the frequency stabilizing system for the laser cavity. Also, some difficulty has been found in getting one of the lasers to operate reliably.

These problems are being investigated and will be resolved as soon as possible.

TASK 23

OPTICS. DRIVE ASSEMBLY

Scheduled percentage of completion	98%
Actual percentage this date	90%

Phasing of the manual operator controls is complete and checkout of the slaved servo systems (e.g. reticle projector system) is proceeding.

All components in this system are performing satisfactorily.

The automatic illumination control system design is complete and fabrication of the modified circuit boards is nearly finished.

Testing of these assemblies is being held up pending receipt of certain components for the circuit boards.

Declassified in Part - Sanitized Copy Approved for Release 2012/08/24 : CIA-RDP79B00873A001400010010-8

TASK 24

IMAGE ANALYSIS SYSTEM

Scheduled percentage of completion	88%
Actual percentage this date	95%

Progress on this task is detailed in [redacted] Progress Report for the period ending August 31, 1969, which is included as Appendix I to this report. STAT

[redacted] has suffered several setbacks in their checkout effort. This has required revision to circuit boards and procurement of additional parts. STAT

Presently, [redacted] has rescheduled their acceptance tests for October 27, 1969. STAT

TASK 26

DIGITIZING LOGIC SUBASSEMBLY

Scheduled percentage of completion	98%
Actual percentage this date	96%

The checkout of the individual subsystem is essentially complete.

Further work is reported in Task 36, Overall Assembly. Please refer to this Task.

Declassified in Part - Sanitized Copy Approved for Release 2012/08/24 : CIA-RDP79B00873A001400010010-8

TASK 27

METRIC READOUT

Scheduled percentage of completion	98%
Actual percentage this date	95%

The checkout of the individual subsystem is essentially complete.

Further work is reported in Task 36, Overall Assembly. Please refer to this Task.

TASK 28

OUTPUT LOGIC AND INTERFACE

Scheduled percentage of completion	98%
Actual percentage this date	98%

The checkout of the individual subsystem is essentially complete.

Further work is reported in Task 36, Overall Assembly. Please refer to this Task.

TASK 29

CABLING

Scheduled percentage of completion	98%
Actual percentage this date	97%

Modification of the harnesses for the stage drives, in order to accommodate the range of motions required, has occurred during this report period.

Several additional cables are being fabricated for shipment to [redacted] for their optical testing programs. STAT

TASK 30

CONTROL CONSOLE AND CHAIR

Scheduled percentage of completion	98%
Actual percentage of completion	90%

Final checkout of the function and readout push-buttons is complete.

The track ball circuitry has been checked out and is operating satisfactorily and the joystick control has been adjusted for proper operation.

The only remaining work to be done in the control console is connected with the film drive joysticks (see Task 12)

TASK 32

COMPUTER

Scheduled percentage of completion	98%
Actual percentage this date	95%

The modifications to the computer circuitry, made and described in the August, 1969, report, have been found entirely satisfactory and no further revisions to the computer are anticipated at this time.

TASK 33

ELECTRONIC RACKS AND CONTROL CABINETS

Scheduled percentage of completion	98%
Actual percentage this date	95%

Certain changes in the Electronics Cabinet #3 (digital equipment) wiring are continuing in order to reduce noise and transmission losses in the digital logic systems.

TASK 34

UTILITIES, VACUUM AND AIR SYSTEMS

Scheduled percentage of completion	90%
Actual percentage this date	90%

The testing of the valves, pressure switches, and air control solenoids is almost complete.

Adjustment of the trip points for the various alarm (failure) sensors is being carried out as the associated systems become operational.

TASK 35

VIBRATION ABSORPTION AND LEVELING

Scheduled percentage of completion	93%
Actual percentage this date	85%

No further work is scheduled for this Task until the Optical Bridge is received from [redacted] At this time, full tests of response time and stage deflection will be conducted. STAT

This delay is necessitated by the requirement for full weight loading of the stages during these tests.

TASK 36

OVERALL ASSEMBLY

Scheduled percentage of completion	76%
Actual percentage this date	50%

Systematic checkout of the interface functions is continuing.

Through modifications to the ground bussing system, described in the August, 1969, report, it has been found possible to reduce the noise levels in the system to within acceptable levels for proper operation.

Propagation delays which were effecting the performance of the digital logic, as described in the August, 1969, report, have been overcome and the interface system appears to be operating entirely satisfactorily.

Work is now proceeding on the digital logic associated with the manual modes of operation of the Stereocomparator.

TASK 37

ELECTRICAL NOISE SUPPRESSION

Scheduled percentage of completion	68%
Actual percentage this date	50%

Noise generation in terms of internally generated unwanted signals, appears as crosstalk and spurious switching signals.

This noise is being systematically eliminated and the work is reported in other Tasks, (32, 29, etc.).

TASK 38

ENVIRONMENTAL CONTROL

Scheduled percentage of completion	98%
Actual percentage this date	92%

The temperature sensors (microthermistors) have been selected for the film cooling air temperature control.

The customer's environmental air conditioning consultant has been advised of the choice and he is now in a position to procure the temperature control system for the film cooling air supply.

TASK 39

RELIABILITY ANALYSIS

Scheduled percentage of completion	34%
Actual percentage this date	20%

There is no formal reliability analysis planned for the project.

The system testing program presently under way has shown that the component and subassembly reliability actually achieved is fully compatible with the needs of the program.

TASK 41

TAPE PUNCH & READER

Scheduled percentage of completion	70%
Actual percentage this date	70%

The high speed tape punch and reader assembly is operating satisfactorily with the computer system in the Stereo-comparator system.

It was found necessary, during the last reporting period, to resharpen the high speed punch dies which had become dulled through use.

Declassified in Part - Sanitized Copy Approved for Release 2012/08/24 : CIA-RDP79B00873A001400010010-8

TASK 42

BREADBOARDS AND TEST DEVICES

Scheduled percentage of completion	90%
Actual percentage this date	65%

Design work on a test panel to be used in the optical acceptance tests at [redacted] has begun. Construction and shipment of this test panel, servo amplifier, and associated cables will be completed as rapidly as possible. STAT

TASK 43

COMPUTER PROGRAMMING AND SERVICES

Scheduled percentage of completion	97%
Actual percentage this date	80%

The programming effort has been terminated until about November 1, 1969, to permit completion of the computer interface checkout and integration with the overall Stereocomparator electronic assembly.

Declassified in Part - Sanitized Copy Approved for Release 2012/08/24 : CIA-RDP79B00873A001400010010-8

TASK 47

INSTRUCTION MANUAL AND DRAWING SUBMITTAL

Scheduled percentage of completion	79%
Actual percentage this date	32%

The revision of the design drawings to cover the "as built" status of the various subassemblies of the Stereocomparator is continuing.

TASK 48

SPARE PARTS LIST

Scheduled percentage of completion	39%
Actual percentage this date	65%

A short list of spare parts has been prepared representing the most critical and longest lead items.

The customer has indicated these critical items will be ordered as soon as possible.

TASK 49

OPERATOR TRAINING

Scheduled percentage of completion	40%
Actual percentage this date	70%

The 80% complete manual, which was submitted to the customer previously, has been informally reported to be satisfactory.

STAT

[redacted] has tentatively scheduled a visit to the customer for October 23rd & 24th, 1969, to discuss details of this and related tasks.

PROGRESS REPORT FOR PERIOD ENDING 31 AUGUST 1969

STAT

1.0 PROGRESS DURING REPORTING PERIOD

Debugging activities continued in August. As described in the July report, the reference phasing was corrected, and the analyzer reference delay adjustment range established. The activities had converged on removing interaction problems, setting the gain and scale factors in order, a checkout of the time base generator, a clean-up, and test considerations.

A voltage and temperature cycling of the time base generator was performed. As described previously, this was done as an adjunct to correcting suspicious behavior of the synchronized time base. The unsynchronized oscillator frequency variation was not significant with line voltage changes because of the mollifying effects of the intervening line-to-load regulation provided by the power supplies. A net change of 0.2% in frequency resulted from a line change from 103 to 126.5 volts. The variation with temperature, however, was -0.5%/^{o}C. Temperature compensation was added to reduce the net variation to $\pm$ 1.1% from 25^{o} to 50^{o}C. No further difficulty was experienced with synchronization.

Electrical crosstalk between outputs was excessive. The interaction was not only between error signals associated with common axes but also between axes. The on-axis distortion was mainly resulting from frequency distortion in the parallax analyzer multiplier. The addition of external sag compensation offered considerable relief from this interaction. A general level of

interference on both axes was traced to the level sensitivity of the video correlator multipliers. To prevent the direct feedthrough of video which accompanied the product of the two correlator inputs, the input levels should be below 0.25 volts rms. The deflection current which shares the power ground with signal current in the 77 feet of cable to the image dissector assemblies was adding unwanted components to the signal, which were analyzed as offsets. An independent double-back connection through the signal-ground line reduced this source of interference. An additional source of interaction between X and Y scale errors was traced to the lack of control of the aspect ratios of the two rasters. To affect the equality $Y_1/X_1 = Y_2/X_2$, a fixed attenuation was inserted in the X_1 line and an adjustment in the X_2 line to the deflection amplifiers. The remaining crosstalk is below the maximum allowable level with the AC threshold removed.

[redacted] who designed the original correlator circuitry, began working on the system on September 16. Don will be making the final setting to assure that the intent of the original design is realized. STAT

2.0 PLANS FOR NEXT PERIOD

Some additional time will be given to [redacted] as explained above. The installation of the component board, wiring clean-up and inspection will follow. STAT

In the interim, the system drawings and the software submissions will be corrected.

Special attention will be given to the improvement of the test procedure.

A later contact will advise you of the test date and any further considerations related to the acceptance tests.

App. II

Declassified in Part - Sanitized Copy Approved for Release 2012/08/24 : CIA-RDP79B00873A001400010010-8