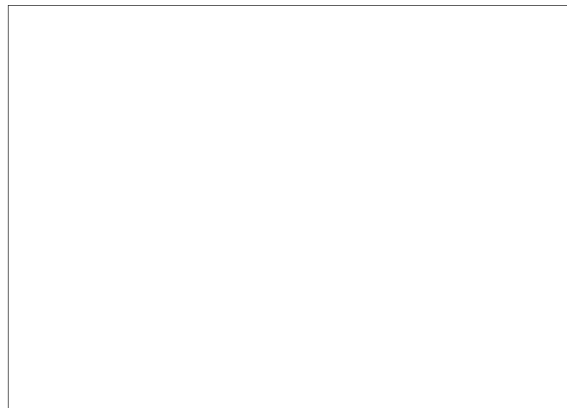
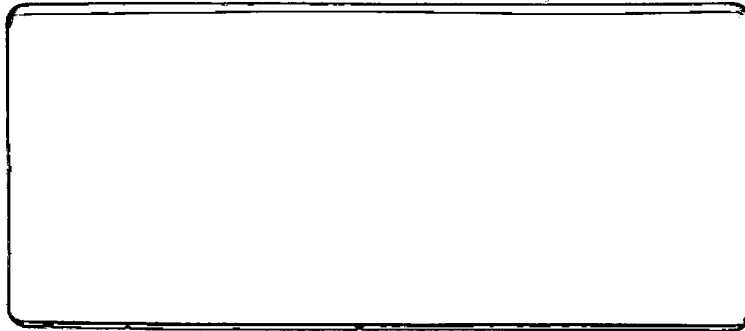


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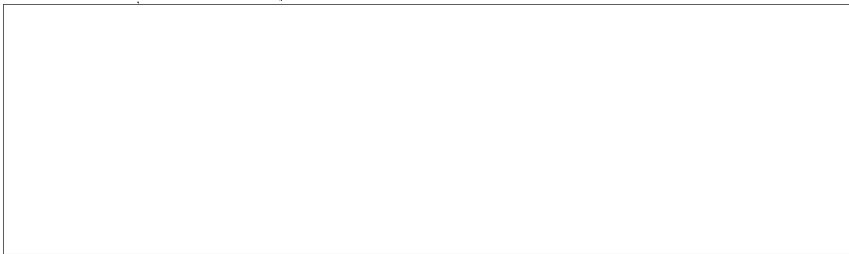
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STATUS REPORT
for Period
1 JULY through 31 JULY 1969
Submitted under Contract to
U. S. Government



File No. 11038

STAT



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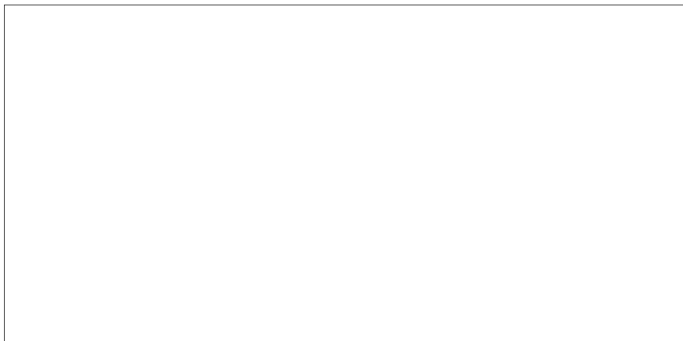
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**This document is presented as the Monthly
Status Report under Contract to the U. S.
Government,**

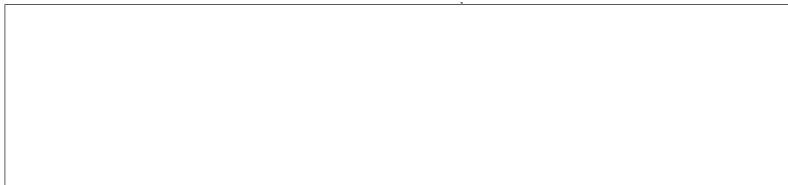
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**The report period represented herein covers
the period 1 July through 31 July, 1969.**

STAT



STAT



INDEX

	<u>Page</u>
Program Status Summary	1
Task 1 Statements of Work, Specifications, Report Preparation	T1 - 1
Task 2 Scheduling and Planning	T2 - 1
Task 3 Test and Inspection Procedures	T3 - 1
Task 4 Management, Administration and Supervision	T4 - 1
Task 5 Meetings	T5 - 1
Task 6 Facilities Requirements	T6 - 1
Task 7 Main Frame	T7 - 1
Task 8 Skin	T8 - 1
Task 9 Granite and Ways Assembly for Stages	T9 - 1
Task 10 Air Bearings	T10 - 1
Task 11 Stage Drives	T11 - 1
Task 12 Film Drives	T12 - 1
Task 13 Film Platen	T13 - 1
Task 14 Film Cooling	T14 - 1
Tasks 16, 17 & 18 Optics	T16, 17 & 18 - 1
Task 20 General Platen Illumination	T20 - 1
Task 21 Optical Bridge	T21 - 1
Task 22 Interferometer Assembly	T22 - 1
Task 23 Optics Drives	T23 - 1
Task 24 Image Analysis System	T24 - 1
Task 26 Digitizing Logic	T26 - 1
Task 27 Metric Readout	T27 - 1
Task 28 Output Logic and Interface	T28 - 1
Task 29 Cabling	T29 - 1
Task 30 Control Console and Chair	T30 - 1
Task 32 Computer	T32 - 1
Task 33 Electronic Racks and Control Cabinets	T33 - 1

Index (cont'd)

		<u>Page</u>
Task 34	Utilities, Vacuum and Air Systems	T34 - 1
Task 35	Vibration Absorption and Leveling	T35 - 1
Task 36	Overall Assembly	T36 - 1
Task 37	R.F.I. Suppression	T37 - 1
Task 38	Environmental Control	T38 - 1
Task 39	Reliability Analysis	T39 - 1
Task 40	Installation	T40 - 1
Task 42	Breadboards and Test Services	T42 - 1
Task 43	Computer Programming and Services	T43 - 1
Task 44	Preacceptance Test in Fabrication Plant	T44 - 1
Task 45	Acceptance Test in Fabrication Plant	T45 - 1
Task 46	Acceptance Test after Installation	T46 - 1
Task 47	Instruction Manuals	T47 - 1
Task 48	Spare Parts Lists	T48 - 1
Task 49	Operator Training	T49 - 1

APPENDICES

Progress Report - for period ending
June 30, 1969

Appendix I

STAT

Progress Report - for period
ending June 30, 1969

Appendix II

STAT

PROGRAM SUMMARY

Scheduled Percentage of Completion	71.2%
Actual Percentage this Date	65.3%

There have been no significant completed activities during the month of July. The work has been proceeding on schedule with particular reference to assembly of the stage utilities and the checkout of the electronics as an integrated system.

All aspects of the Stereocomparator project are proceeding in a manner fully compatible with the requirements of the program.

Task 1 Statements of Work, Specifications,
 Report Preparation

Scheduled percentage of completion 74%

Actual percentage this date 74%

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 74%

Actual percentage this date 74%

No change in schedule has been made during the month.

The optical vendor's schedule has been brought up-to-date and indicates that the equipment will be provided for

testing, at the plant, by December 15, 1969.

STAT

Task 3 Test and Inspection Procedures

Scheduled percentage of completion 61%

Actual percentage this date 53%

All test targets and photography, for the use of the optical and correlation vendors, have been delivered to the vendors.

Work is proceeding on the development of the detailed test procedures utilizing the targets and photography.

Task 04 Management, Administration and Supervision

Scheduled percentage of completion 74%

Actual percentage this date 74%

Management and administrative functions are proceeding normally with no major departures from the original Management plan.

Task 5 Meetings

Scheduled percentage of completion 74%

Actual percentage of completion 74%

Meetings were held with customer representatives the week of July 7th and the week of July 14th. During these periods, the computer programing details and the equipment installation environment were discussed.

In addition, dirt particle counts were made on the Clean Room supply air and in the room during its periods of activity and inactivity. It appeared that the Clean Room system was compatible with the requirements of the Stereocomparator.

STAT

STAT

However, special cleaning of all surfaces of the room were indicated to maintain a suitable condition during work activity.

Task 6 Facilities Requirements

Scheduled percentage of completion 98%

Actual percentage this date 90%

The Clean Room is in operation with respect to the work area in the room and the electronic cabinet air systems.

STAT

The temperature control for these two systems failed due to control instrument defects and replacement parts are being provided by the vendor. It is hoped that the temperature controls will be back in operation by the end of July.

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 44%

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 Stereocomparator has been completely assembled.

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 92%

As previously reported, the air bearings were installed on both stages in February.

No further work will be scheduled until the utility cabinet is completed, following which the bearings will be tested with the interferometers.

Task 11 Stage Drives

Scheduled percentage of completion 98%

Actual percentage this date 70%

Installation of the stage drive assemblies on the right and left hand stages was completed during the month of June.

Testing of the assemblies will be conducted after the utilities cabinet has been completed.

Task 12 Film Drive and Transport System

Scheduled percentage of completion 86%

Actual completion this date 70%

The wiring for the film drive and transport system has been partially completed.

The left stage film drive wiring is complete.

After completion of the wiring systems, servo compensation of these units can proceed.

Task 13 Film Platen and Film Clamping

Scheduled percentage of completion 98%

Actual percentage this date 88%

The film clamping and film platen assemblies are awaiting dynamic testing pending completion of the air relay logic wiring.

The wiring for the modified air control system has begun.

Task 14 **Film Cooling**

Scheduled percentage of completion 93%

Actual percentage this date 60%

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

T14 - 1

Tasks 16, 17
and 18

Viewing Optics, Viewing Illumination, Reticle
Projector and Illumination

Scheduled percentage of completion 91%

Actual percentage this date 86%

The work of integrating the [] supplied optical
drive equipment with the vendor's supplied optical systems was
continued.

STAT

[] has sent to [] approximately 95% of the
servo components for installation in the optical bridge. []
is also performing the necessary wiring and cabling work involved
in the installation.

STAT

STAT

[] has scheduled assembly and test activities
during their regular August annual vacation and the [] monitor will
be in their plant during this period.

STAT

STAT

Task 20 General Platen Illumination

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

The platen illumination equipment has been installed on the Stereocomparator and will be tested on the machine when its wiring is complete. The units were previously bench tested and performed satisfactorily.

Task 21 Optical Bridge and Supports

Scheduled percentage of completion 96%

Actual percentage this date 90%

No further work is scheduled until receipt
of optics from subcontractor.

Task 22 Interferometer Assembly

Scheduled percentage of completion 84%

Actual percentage this date 68%

Concern exists regarding the laser interferometer return beam effecting the cavity servo control on the laser. A report was prepared concerning this problem.

STAT

In addition, a polaroid and quarter wave plate sandwich has been received and will be tried out as a means of minimizing the effects of the laser on the return beam.

Tests cannot be performed on the interferometer until the temperature control system is performing to the proper specifications, (see Task 6).

STAT

Task 23 Optics Drive Assembly

Scheduled percentage of completion	84%
Actual percentage this date	80%

The main optics drive assembly tests were completed during this report period. The simulated optics systems were driven by the computer, the A/D - D/A converters, and the computer interface circuitry. The entire system displayed an accuracy of 1 bit. The crosstalk and noise present was not sufficient to cause a 1 bit change.

The slaved and non-servo optics drives tests were started and should be completed during the next report period.

The automatic brightness control loop computer model was completed and it is now in the fabrication stage.

Task 26 Digitizing Logic Subassembly

Scheduled percentage of completion 98%

Actual percentage this date 93%

**This Task is now covered under the discussion in
Task 28 - Output Logic and Interfaces.**

Please refer to this Task.

Task 27 Metric Readout

Scheduled percentage of completion 98%

Actual percentage this date 95%

This Task is now covered under the Output Logic
and Interfaces, Task 28.

Please refer to this Task for a progress report.

T27 - 1

Task 28 **Output Logic and Interface**

Scheduled percentage of completion 98%

Actual percentage this date 85%

The tests of the computer interface and AD/DA converters, which was done for a simulated optics drive test, was completed.

A test of the film and stage drive logic and metric readout has begun.

Task 29 Cabling

Scheduled percentage of completion 98%

Actual percentage this date 96%

Additional manufacture and checkout of cables was
done during the last report period.

T29 - 1

Task 30

Control Console and Chair

Scheduled percentage of completion	97%
Actual percentage of completion	85%

The checkout and testing of the console and its associated interface circuitry continued during this last month. This includes testing of the manual optical controls and readout digits as well as the function control pushbuttons.

The IBM 526 punch will be used to aid in the testing of the readout characters which will begin next month.

Task 32 Computer

Scheduled percentage of completion 98%

Actual percentage this date 95%

No new work was done to the computer circuitry during this last report period since the computer is already installed and working.

Task 33 Electronic Racks and Control Cabinets

Scheduled percentage of completion 98%

Actual percentage this date 90%

The internal cables in the electronic racks were installed and harnessed.

Task 34 Utilities, Vacuum and Air Systems

Scheduled percentage of completion 87%

Actual percentage this date 80%

The electrical wiring for the valves, pressure switches and air control solenoids was begun during this report period.

Task 35 . Vibration Absorption and Leveling

Scheduled percentage of completion 90%

Actual percentage this date 85%

No further work is scheduled for this Task until the Optical Bridge is received from . 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	62%
Actual percentage this date	38%

Work is continuing on the mechanical assembly of the stages with respect to the vacuum, air and wiring facilities.

The electrical cable connection panel and air bearing air connection panel is being installed in the rear of the Stereo-comparator.

The electronic assembly work was essentially completed previous to this month and the work currently consists of checkout and testing of the many subassemblies as an integrated system.

Task 37 Radio Frequency Noise Suppression

Scheduled percentage of completion 0%

Actual percentage this date 0%

No work was scheduled on this Task for the
month of July.

Task 38 Environmental Control

Scheduled percentage of completion 83%

Actual percentage this date 89%

Meetings were held with the customer site preparation consultant with special reference to the film cooling air system.

This equipment has been designed and is ready for fabrication as part of the site preparation. The device appears to be fully compatible with the needs of the Stereocomparator.

Task 39 Reliability Analysis

Scheduled percentage of completion 17%

Actual percentage this date 0%

No work was scheduled on this Task for the month
of July.

Task 40

Installation

Scheduled percentage of completion 0%

Actual percentage this date 18%

No work was scheduled or performed on this task



STAT

T40 - 1

Task 42 Breadboards and Test Devices

Scheduled percentage of completion 65%

Actual percentage this date 55%

The servo compensation and performance tests were completed during this report period (see Task 23).

The servo breadboards have been disassembled and the required components have been shipped STAT

The remaining testing of the tracking program can be done without the breadboards.

Task 43 Computer Programming and Services

Scheduled percentage of completion 89%

Actual percentage this date 70%

progress report for the period June 1
to June 30, 1969, is included as Appendix II to this report.

STAT

**Informatics' computer programming personnel was
included in the meetings between and the customer concerning
the review of the computer program concepts for the Stereocomparator.**

STAT

Task 44 Preacceptance Test in Fabrication Plant

Scheduled percentage of completion 0%

Actual percentage this date 0%

No work was scheduled for this Task for the
month of July.

T44 - 1

Task 45 Acceptance Test in Fabrication Plant

Scheduled percentage of completion 0%

Actual percentage this date 0%

No work was scheduled for this Task for the
month of July.

Task 46 Acceptance Test After Installation

Scheduled percentage of completion 0%

Actual percentage this date 0%

No work was scheduled on this Task for the month
of July.

T46 - 1

Task 47 Instruction Manual and Drawing Submittal

Scheduled percentage of completion 59%

Actual percentage this date 27%

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

Task 48 Spare Parts List

Scheduled percentage of completion 39%

Actual percentage this date 50%

An addendum to the Spare Parts List has been completed. This updates the Spare Parts List through this report period.

The anticipated life and replacement time of the spares is presently being computed.

Task 49 Operator Training

Scheduled percentage of completion 40%

Actual percentage this date 70%

During July, the first 80% of the Operator Training Manual was delivered to the customer for their review.

Some preliminary discussions were held relative to the sending of customer representatives to for orientation with respect to the actual operation and the computer programing aspects of the Stereocomparator.

STAT

It is indicated that, at about the end of 1969, the Stereocomparator would be sufficiently complete to make an operating review (operator training program) of the equipment feasible.

This problem is thus not critical at this time. However, as the completion date approaches, the necessity for planning for customer orientation is apparent.

PROGRESS REPORT FOR PERIOD ENDING 30 JUNE 1969

STAT

1.0 PROGRESS DURING REPORTING PERIOD

The test fixture support was redone using black anodized 3/8 inch aluminum tool plate. The fixture was reassembled with new gussetts and shock mounting on the blower assembly. The fixture is more rigid and durable with no noticable vibration. The plywood support was discarded.

Preacceptance testing was started in June. This phase of the project is used to correct wiring difficulties and to affect circuit adjustments and changes which enable the system to perform to specifications. As a Quality Assurance measure, the test equipment used during this phase was sent out for calibration. The untimeliness of this procedure, however, caused some delays in testing. A suitable illumination meter was detained until 8 July in the process.

The S20 image dissector tubes required rewiring because of dissimilar socket connections and additional voltage requirements over the S11 tubes.

Mutual coupling effects from the 77 foot cable runs made it necessary to modify the circuit boards in the image dissector assemblies to accommodate bypass capacitors on the power supply lines and resistive bias dividers. Decoupling was extended to both modules in each video amplifier.

The Reynolds Industries high voltage cable assemblies broke down after a short period of relatively normal use. The cables were purchased with certification of high-potential testing and not subjected to unusual stress, which might destroy their high-voltage integrity. Three of the four cables developed leakage in excess of

- 2 -

500 microamperes at voltages under 500 volts (as indicated on an Associated Research Inc, Hypot Junior meter). Arcing at low voltages was also observed at the connectors. The Reynolds cable assemblies will be replaced with RG 142 B/U which has a .116" core diameter as opposed to the .050" diameter of Reynolds "L" cable. Both cores are teflon (FEP). AMP connectors type 10-M-3000 panel, type 101-M-3800-75 bulkhead, and type 101-M-1800 cable connector will be used. Cable drawings will be revised and cutout dimensions forwarded at a later date.

STAT

Limited testing and debugging continue with temporary high voltage lines. Since the image dissector assemblies are being tested without their housings, an open frame fixture is used. Proper alignment to make final derminations and adjustments cannot be maintained until permanent connections make the use of the test fixture possible.

Notations of wiring and component changes are being maintained. However, drawings will not be updated until the tests are complete.

2.0 PLANS FOR NEXT PERIOD

Preacceptance testing will continue, acceptance testing is currently projected to the last week of August.

STAT

Percentage of job completed to date - 90%.

APP. II

MONTHLY PROGRESS REPORT

June, 1969

This technical report is for the reporting period from June 1 to June 30, 1969. The report is prepared according to STAT Specification number DB1001 (as modified).

1. At the end of the month, subroutines
 - a. CONVRT
 - b. DATAIN
 - c. PARMOD
 - d. SCANER
 - e. FID1
 - f. TTIN
 - g. TTIC and
 - h. RECIN

were checked out and documented.

During the month, these routines underwent considerable redesign. As a result, the function of subroutine TBSRCH has been incorporated into PARMOD itself. Also, subroutine NOCAM's function has been assumed by EXEC1.

A new entry ASCDEC has been coded into subroutine ASCBIN. While ASCBIN decodes ASCII to floating point, ASCDEC decodes ASCII to fixed point binary.

Although a system tape has been created for the real time program, it has been used very little because work on the computer interface

and D/A converters has not progressed sufficiently.

With most of the redesign of the non-real time program behind us now, work should soon begin proceeding at an encouraging rate. As of this reporting period, approximately 70% of the total contract work has been completed.

2. Next month, the redesign of the non-real time program will be completed. Completion involves:
 - a. Redesign of FID2 and FID3.
 - b. Modifications to EXEC1 to accommodate the many changes of its subordinates.
 - c. Checkout of the stage initialization supervisor STAGIN.

After completion of the redesign, the non-real time program will be integrated. It should be completely operational by the end of July.

3. At the end of May the problem of how to filter the crosstalk out of the correlator had not yet been resolved. This has a low priority because it is not really clear that crosstalk will even be a problem.

4. At the time of this writing the contract extensions is in the final stage of negotiation. will be transmitting STAT
two signed copies of the agreement before the end of July.

5. will continue working second shift through the second week of August. After that it has been agreed that he will return to day shift for the duration of the contract. STAT

6. No changes or agreements have been made requiring the contracting officer's approval.

7. No other unresolved matters are known to exist.

ALPHABETICAL SUBPROGRAM INDEX

General Subprogram Flow Diagram Page 8

<u>D</u>	<u>✓</u>	<u>C</u>	<u>Name</u>	<u>Page No.</u>	<u>D</u>	<u>✓</u>	<u>C</u>	<u>Name</u>	<u>Page No.</u>
✓	✓	✓	CAMATS	118-123	✓	✓	✓	PTOP	105-111
✓	✓	✓	ASCBIN						
✓	✓	✓	CONVRT	44	✓		✓	RDOP	140-142
✓	✓	✓	CVB	130,131	✓		✓	RDST	143,144
✓	✓	✓	CVF	132,133		✓	✓	RECALL	66-68
✓	✓	✓	DATAIN	27-31	✓	✓	✓	RECIN	45,46
	✓	✓	EXEC 1	17-19	✓	✓	✓	REORT	83-88
	✓	✓	EXEC 2	20-25	✓	✓	✓	SCANER	39,40
			EXINA	152-154	✓		✓	STAGIN	49-55
			EXSKS	155,156				TBSRCH	36-38
✓	✓	✓	FID 1	56-58	✓		✓	TICT	134-136
✓	✓	✓	FID 2	59-62	✓		✓	TICX	137-139
✓	✓	✓	FID 3						
✓	✓	✓	FIXR	157,158	✓	✓	✓	TMAT	89-99
✓	✓	✓	GTP	80-82	✓	✓	✓	TRK	69-79
	✓	✓	LSTC/PSET	145,146	✓	✓	✓	TTIC	63-65
✓	✓	✓	MATMAK	127-129	✓	✓	✓	TTIN	47,48
✓	✓	✓	MSGIN	147,148	✓		✓	T 2 PAN	112-115
✓	✓	✓	MSGOUT	149-151	✓		✓	T 2 STRP	
✓	✓	✓	MTS	100-104	✓	✓	✓	XXM I	124-126
			NOGAM	41-43				XAJ	
✓	✓	✓	PARMOD	32-35			✓	YMR	116,117
			PRESET					RDCR/X	

C = coded
 ✓ = code checked
 D = documented

