



copy 1
12 - cost,
3 - 273
John W. Levison
25/57-577

FUL-0114-65
Copy 1 of 5

NEGOTIATED CONTRACT

Contract No. MB-1957

Itek Corporation
Lexington
Massachusetts

Contract For: See Schedule

Amount: See Schedule

Mail Invoices To:

Performance Period:
See Schedule

Administrative Data:

This contract is entered into by and between the United States of America, hereinafter called the Government, represented by the Contracting Officer executing this contract, and the above-named Contractor which is a corporation, incorporated in the State of Delaware, hereinafter called the Contractor.

The parties hereto agree that the Contractor shall furnish the facilities and deliver all supplies and perform all the services set forth in the attached Schedule issued hereunder for the consideration stated therein.

The rights and obligations of the parties to this contract shall be subject to and governed by the attached schedule and General Provisions. In the event of any inconsistency between the Schedule and the General Provisions, the Schedule shall control.

IN WITNESS WHEREOF, the parties hereto have executed this contract as of 31 December 1964.

SIGNATURES

Itek Corporation
Lexington, Massachusetts

THE UNITED STATES OF AMERICA

BY WJ Levison

BY

TITLE Contracting Officer

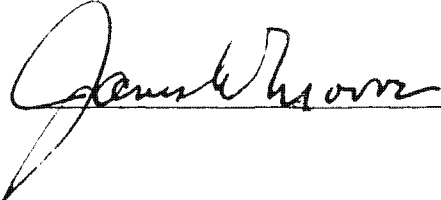
TITLE Contracting Officer

DATE 31 December 1964

Contract MB-1957

CERTIFICATE

I, JAMES W. MOORE, certify that I am
the SECRETARY of the Corporation
named as Contractor herein; that W. J. LEVISON
who signed this contract on behalf of the Contractor
was then VICE-PRESIDENT of said Corporation;
that said contract was duly signed for and in behalf
of said Corporation by authority of its governing body,
and is within the scope of its Corporate powers.

 (Corporate Seal)

INDEX

	<u>PAGE</u>
PART I - SCOPE OF WORK . . . . .	.4
PART II - PERIOD OF PERFORMANCE . . . . .	.4
PART III - ESTIMATED COST AND FIXED FEE . . . . .	.4
PART IV - PAYMENTS . . . . .	.4
PART V - FACILITIES . . . . .	.5
PART VI - MONTHLY COST STATUS REPORT. . . . .	.5
PART VII - WAIVER OF REQUIREMENTS OF GENERAL PROVISIONS . . . . .	.5
PART VIII - SPECIAL SECURITY RESTRICTIONS . . . . .	.6
PART IX - SUPERSESSION OF PRIOR DOCUMENTS . . . . .	.6
PART X - TECHNICAL DIRECTION AND SYSTEM ENGINEERING AND ASSEMBLY CONTRACTOR . . . . .	.6

SCHEDULE

PART I - SCOPE OF WORK

Contractor shall furnish the necessary services and facilities to accomplish the work set forth in Appendix I attached hereto and made a part of this contract.

PART II - PERIOD OF PERFORMANCE

The schedule of deliverable items is as set forth in Appendix I. The period of performance of this contract is from 1 July 1964 through 31 January 1965.

PART III - ESTIMATED COST AND FIXED FEE

a. The total estimated cost for the performance of this contract is \$2,851,106.00.

b. The fixed fee for the performance of this contract is \$225,000.00.

PART IV - PAYMENTS

a. In accordance with the provisions of Clause 4 of the General Provisions of this contract entitled, "Allowable Cost, Fixed Fee, and Payment," the Government shall pay the Contractor, as full compensation for the performance of this contract, the fixed fee as specified in PART III above and the allowable cost incurred by the Contractor in the performance of this contract, and accepted by the Contracting Officer as chargeable in accordance with "Contract Cost Principles, Section XV, Part 2, Armed Services Procurement Regulations," such determination being subject to the provisions of this contract entitled "Disputes." It being understood and agreed, without limiting the generality of the foregoing, that the following shall be considered as allowable items of costs incurred hereunder when incurred or paid by the Contractor, and when necessary and required and used for the performance of work hereunder:

1. All costs which have been incurred by the Contractor on or after 1 July 1964, in anticipation of and prior to the signing of this contract, and which, if incurred after the signing of this contract, would have been considered as items of allowable costs hereunder, will be accepted by the Contracting Officer as allowable costs under this contract.

b. For purposes of billing current costs incurred under this contract or until such time as an audit of Contractor's interim or final vouchers is made by the Contracting Officer or his authorized representative, the Contractor shall, for purposes of computing costs, use those rates which are currently approved by the cognizant military department for billing purposes under CPMF contracts.

c. Contractor shall be paid the fixed fee stated in PART III hereof in monthly installments based on allowable costs incurred by the Contractor and approved by the Contracting Officer computed at the same ratio that the total fixed fee stated herein is to the total estimated cost stated herein, subject, however, to the withholding provisions of paragraph (c) of Clause 4 of the General Provisions hereof.

PART V - FACILITIES

Contractor is authorized to use on a no-charge-for-use basis those facilities furnished or to be hereinafter furnished under Air Force facilities contract No. AF33(657)-8886, provided the use of such facilities does not interfere with the purpose for which such facilities are being furnished.

PART VI - MONTHLY COST STATUS REPORT

Contractor shall submit a monthly report of expenditures and commitments incurred under the contract, together with an estimate of costs to complete the contract. If the total is different from the estimated cost, Contractor shall give reasons therefor. The detailed format and submission dates will be the subject of further negotiation between the parties.

PART VII - WAIVER OF REQUIREMENTS OF GENERAL PROVISIONS

Notwithstanding the requirements of any of the General Provisions of this contract to the contrary, whensoever the Contractor in performance of the work under this contract, shall find that the requirements of any of the clauses of the General Provisions are in conflict with security instructions issued to the Contractor by the Contracting Officer or by his duly authorized representative for security matters, the Contractor shall call the attention of the Contracting Officer to such conflict and the Contracting Officer or his duly autho-

rized representative for security matters shall (i) modify or rescind such security requirements or (ii) the Contracting Officer shall issue to the Contractor a waiver of compliance with the requirements of the General Provisions conflicting with such security requirements. Any waiver of compliance with the General Provisions of this contract issued by the Contracting Officer shall be in writing, except that the approval by the Contracting Officer of any subcontract issued hereunder by the Contractor shall be deemed to constitute approval of waiver of any clauses of the General Provisions in conflict with the stipulations of such subcontract.

PART VIII - SPECIAL SECURITY RESTRICTIONS

The Contractor shall not reveal (i) the specific nature or any details of the work being performed hereunder or (ii) any information whatsoever with respect to the department of the Government sponsoring this contract and the work thereunder except as the Contractor is directed or permitted to reveal such information by the Contracting Officer or by his duly authorized representative for security matters and notwithstanding any clause or section of this contract to the contrary, the Contractor shall not interpret any clause or section of this contract as requiring or permitting divulgence of such information to any person, public or private, or to any officer or department of the Government without the express consent of the Contracting Officer or his duly authorized representative for security matters.

PART IX - SUPERSESION OF PRIOR DOCUMENTS

On the effective date of this contract, the parties hereto agree that this document shall supersede in its entirety Letter Contract No. MB-1957 and all modifications thereto.

PART X - TECHNICAL DIRECTION AND SYSTEM ENGINEERING AND ASSEMBY CONTRACTOR

a. The technical direction of the work called for under this contract is vested in the Government and more specifically the Program Office for this Project FULCRUM. The names of the Technical Director and his assistants have been made known to the Contractor and it agrees to accept such direction from this Program Office.

b. It is further recognized that the system engineering of this program and any of assembly of the finally developed system shall be furnished by another Contractor who is under a Government contract with the procuring agency. Contractor agrees to abide by such direction and guidance as may be furnished from time to time by this SEAC Contractor.

APPENDIX I

Statement of Work
Contract MB-1957

A. Contractor shall furnish the necessary services, facilities and materials to perform the work set forth below and make delivery to the Government at the times and places specified herein.

1. Scope

Contractor shall perform the necessary design, development, tests, fabrication of test hardware, conduct tests and furnish data thereon in accordance with the statement of work set forth below as said statement is amended by APPENDIX II, attached hereto and made a part of this contract.

TASK 1. OPTICAL BAR SYSTEM

1.1 Film Transport System

Itek will design and fabricate a brassboard of a high speed film transport system for use in an optical bar type panoramic system which has the capability of maintaining film velocities to the level of accuracy consistent with the requirements of a high resolution (minimum of 100 l/mm on film) panoramic camera system for use in photography from orbiting satellites which may operate in a V/h range from 0.035 to 0.06 rad/sec. This transport will be suitable for use with a 60-inch f/3.0 Maksutov folded mirror system.

The principal features of this transport will include a minimum inertia film drum whose axis is perpendicular to the optical bar axis, continuous film transport having no skew rollers, an optical bar supported in two small diameter bearings with the film supply spool and intermediate take-up spool located at opposite ends of the optical bar. A method of coding the film will be incorporated such that an accurate accounting of the positions of the unexposed areas of the film can be maintained in order that these areas can be exposed at a later time. A careful study will be made of the reliability and practicality of the film reversing operation. Careful evaluation will be given to minimizing film wastage and power consumption.

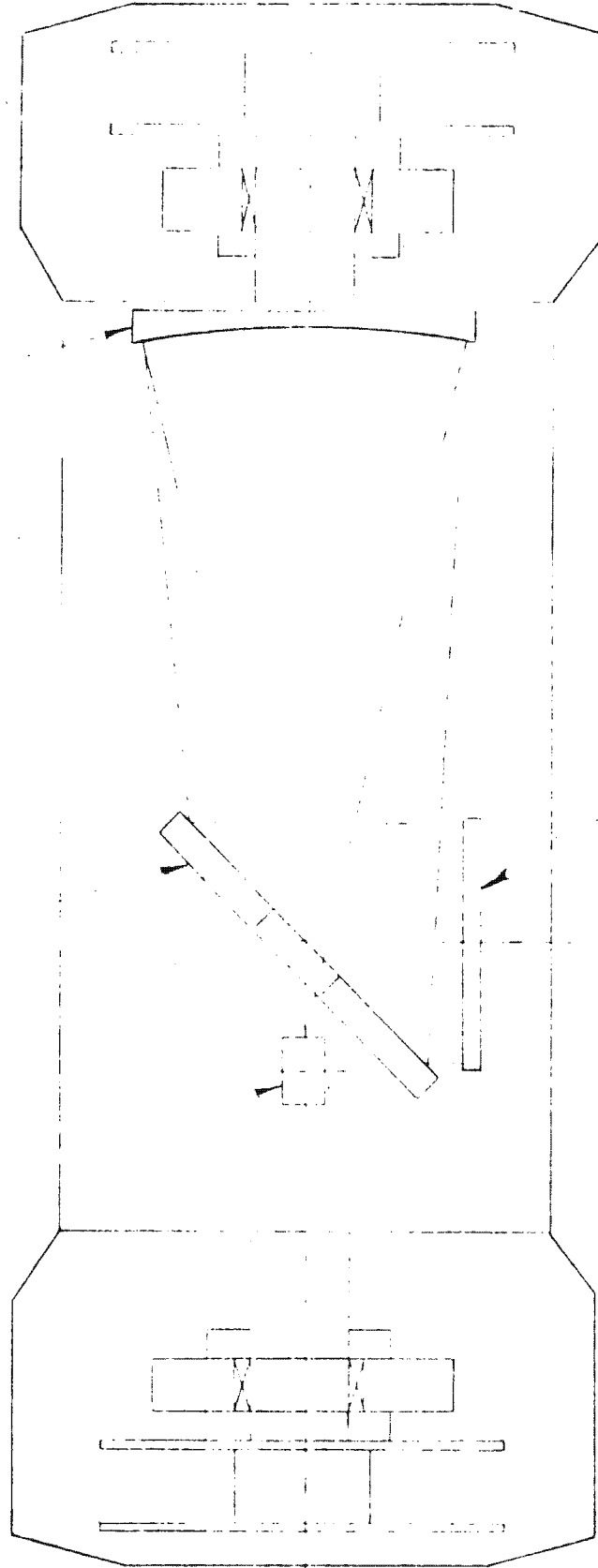
The brassboard shall be a full scale, "true configuration," model of the film transport system including only supply & take-up spools,

SPECIAL OPTICAL
ROTATING OPTICAL RAMP SYSTEM

— PRIMARY MIRROR

— FILM METERING DRUM

— FOLDING MIRROR



— ASPHERIC PLATE

Approved for Release: 2021/04/09 C05099637
incorporated in an optical bar structure shortened by the elimination of the optical system but complete with all optical bar drive components, bearings, slip rings, etc. The film drive subassembly shall be complete with all necessary IMC motions and counter balances, fiducial marking, and film coding subsystems. Compromises of the "ultimate" design may be made, where necessitated by component availability, if the resultant brassboard is compatible with the "ultimate" design.

1.2 Camera System Design

The following system design efforts will be accomplished:

- a. Perform a detailed design study (including layouts) of the main camera, incorporating film transport and optics indicating size, location and configuration of all significant subassemblies.
- b. Perform a design study of camera structure, system support structure, and structural mounts to vehicle.
- c. Prepare main camera specifications, establishing detail design and performance requirements.
- d. Establish and maintain camera block diagrams, and timing diagrams.
- e. Perform a detailed design study (including layouts) of the other components of the camera system (i.e., recovery take-up).

Prepare a detailed camera system assembly drawing indicating film path, light shielding, windows, cabling, and defining the relationship of the camera system components to the vehicle.

- f. Perform an analysis of the camera system thermal requirements, including preliminary determination of insulation, heaters, sinks, special equipment materials and/or configurations, etc.
 - g. Establish system requirements for electrical controls and equipment i.e., programmer, clock, cabling, connectors, power, etc.
 - h. Maintain current estimates of system weights, balance, and inertias.
 - i. Prepare camera system equipment specifications, establishing detail design and performance requirements.
 - j. Establish and maintain camera system block diagrams, and timing diagrams.
 - k. Prepare an interface specification and installation drawings for relation of camera system to vehicle and recovery system, indicating dimensions and locations, weights, C.G.'s, inertias, momentum unbalances, power requirements, interface connectors, control commands, window size, vehicle mounts, light shielding, pressure control, attitude stabilization rates and accuracies, vibration, etc.
 - l. Conduct liaison with vehicle and recovery system contractors to establish and maintain system compatibility.
 - m. Prepare camera system performance (design) specifications (i.e., vibration, thermal, shock, acoustic, etc.) based upon vehicle and recovery system design data.
-

- n. Fabricate and maintain a full-scale non operating (wooden) mockup of the complete photo system establishing all component sizes and locations, film paths, windows, support structure, vehicle mounts, interface connections, cable runs, etc.
- o. Devise a feasible plan for and establish a practical method of incorporating into the camera a fiducial system such that a definite relationship can be established between image points and the original object points.
- p. Consider the parameters affecting the maintenance of a pressure at the film transport area such that corona discharge can be obviated. If air bearings are used the spillage from these bearings will be accounted for and calculations made for additional make up air.

1.3 Test

Itek will generate a test plan, develop test equipment, and perform tests to clearly demonstrate the capability of the film transport brassboard. The model will be operated at both ambient atmospheres and in a vacuum chamber to ascertain the dynamic effects of the absence of air, detect the possible presence of corona discharge, and evaluate the eligibility of the required forward and reverse motion of the film. No further environmental testing will be undertaken in conjunction with this effort. Vacuum tests will be conducted using existing facilities which are currently being utilized on other Government contracts. This effort is predicated upon the use of these facilities on a non-interference basis. All design, testing and evaluation shall conform to good commercial practice rather than to military specifications.

At the conclusion of the seventh month, a detailed evaluation report of the two prototypes will be delivered. This report will include the following:

- a. The results of experiments designed to measure the film velocity errors with description of measuring techniques.
- b. Potential image degradation due to film velocity error.
- c. The results of environmental chamber tests designed to examine film handling problems (such as corona discharge) at operational gas pressures and film velocities.
- d. The results of experiments with EK Type 4404 7-inch film designed to test the prototype for film damage (scratching, etc.).

1.4 Gas Bearing Analysis

1.4.1 Franklin Institute Effort

Itek will subcontract to Franklin Institute the task of analyzing the problems associated with the utilization of gas bearings in a space environment. Parameters will be established such that the results of this analysis will be applicable to the bearing requirements of the proposed camera system. If gas bearings appear warranted, Franklin Institute personnel will be utilized on a consultant basis during the fabrication and testing of such a bearing.

1.4.2 Liaison Effort

Itek will maintain liaison with Franklin such that the study is pertinent and can be utilized to greatest effectiveness.

TASK 2. ONE THIRD FOCAL LENGTH SYSTEM

2.1 Film Transport Breadboard

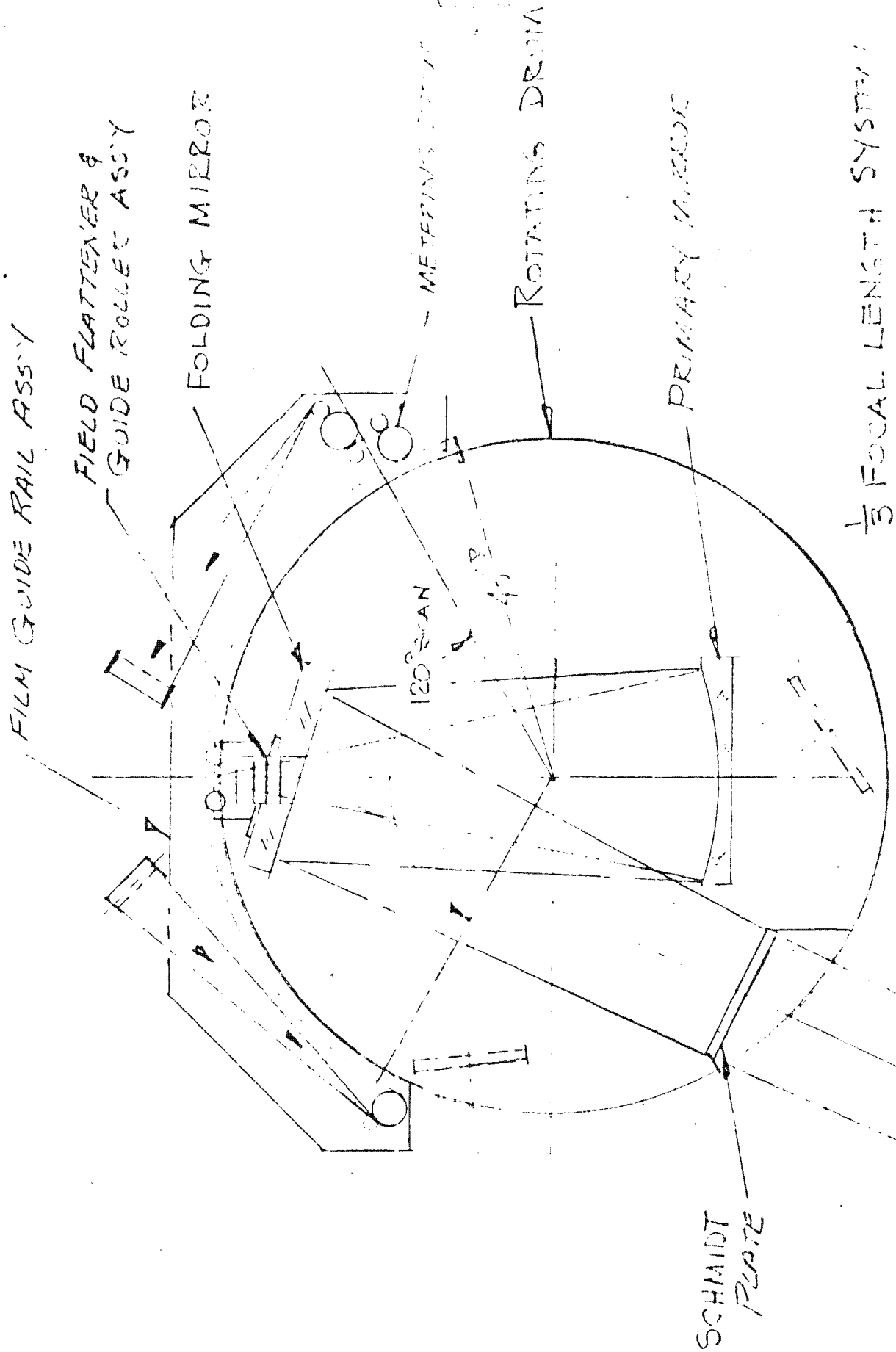
Itek will design, develop and test a feasibility breadboard of the continuous film transport system for the 1/3 focal length, 120° scan, camera system with the Schmidt-corrected optical system.

This breadboard shall be of the "table top" type, rather than a complete "true configuration" of the entire film transport system, for the purpose of demonstrating that the film can be continuously driven at a precise velocity past the scan head throughout the 120° scan angle. The breadboard shall incorporate film rails, scan head, film rollers and dancer loops, cross-track and along-track IMC motions as necessary, to clearly demonstrate feasibility.

Effort on this task shall be based upon the findings of a film drive analysis now being conducted for this configuration.

2.2 Camera Design

Itek will prepare the preliminary design of the 1/3 focal length main camera, incorporating the film transport which is described in Section 4.1. The camera shall consist of the Schmidt-corrected optical system, rotating about an axis 1/3 of the focal length from the nodal point with 120° scan and continuous motion film transport. Detailed camera layouts and specifications of the entire camera and major components shall be prepared.



1/3 FOCAL LENGTH SYSTEM
 600 FL f/3 OPTICAL SYSTEM

Ittek will fabricate a full scale mock-up of a single camera in a vehicle framework to establish the in-vehicle configuration, camera to vehicle mount configuration, window position, and light trap methods.

The following design efforts will be accomplished:

- a. Perform a detailed design study (including layouts) of the main camera, incorporating film transport and optics indicating size, location and configuration of all significant subassemblies.
- b. Perform a design study of camera structure, system support structure, and structural mounts to vehicle.
- c. Prepare main camera specifications, establishing detail design and performance requirements.
- d. Establish and maintain camera block diagrams, and timing diagrams.
- e. Prepare a detailed camera system assembly drawing indicating film path, light shielding, windows, cabling, and defining the relationship of the camera system components to the vehicle.
- f. Maintain a current estimate of camera weight, balance and inertias.
- g. Prepare an interface specification and installation drawings for relation of camera system to vehicle and recovery system, indicating dimensions and locations, weights, C.G.'s, inertias, momentum unbalances, power requirements, interface connectors, control commands, window size, vehicle mounts, light shielding, pressure control, attitude stabilization rates and accuracies, vibration, etc.

- h. Conduct liaison with vehicle and recovery system contractors to establish and maintain system compatibility.
- i. Devise a feasible plan for and establish a practical method of incorporating into the camera a fiducial system such that a definite relationship can be established between image points and the original object points.
- j. Consider the parameters affecting the maintenance of a pressure at the film transport area such that corona discharge can be obviated. If air bearings are used, the spillage from these bearings will be accounted for and calculations made for additional make-up air.

2.3 Test

Itek will generate a test plan, develop test equipment, and perform tests to clearly demonstrate the capability of the film transport breadboard. The model will be operated in a vacuum chamber to ascertain the dynamic effects of the absence of air and to detect the possible presence of corona discharge. No further environmental testing will be undertaken in conjunction with this effort. Vacuum tests will be conducted using existing facilities which are currently being utilized on other Government contracts. This effort is predicated upon the use of these facilities on a non-interference basis.

All design, testing and evaluation shall conform to good commercial practice rather than to military specifications.

At the conclusion of the seventh month, a detailed evaluation report of the two prototypes will be delivered. This report will include the following:

- a. The results of experiments designed to measure the film velocity errors with description of measuring techniques.
- b. Potential image degradation due to film velocity error.
- c. The results of environmental chamber tests designed to examine film handling problems (such as corona discharge) at operational gas pressures and film velocities.
- d. The results of experiments with EK Type 4404 7-inch film designed to test the prototype for film damage (scratching, etc.).

TASK 3. OPTICAL DESIGN AND FABRICATION

3.1 Optical Bar System

3.1.1 Optical Design

A six month effort is planned for completion of a final optical design for the proposed system. The optical system to be designed shall be a 60-inch focal length, f/3 system, 6-inch field, capable of providing the best possible image quality on EK type 4404 film with a minus blue filter. The type of lens shall be a catadioptric, corrected by a Schmidt or meniscus, preferably with no aspheric surfaces. The overall length and other optical characteristics shall be suitable for the intended application.

An optical design will be carried out using ^{an} ~~our~~ 924 computer. The length constraints of the system will require modification of existing programs. The mechanical and thermal tolerances will be programmed and analyzed and system analysis will be done to evaluate the effect of environment upon the optical system.

As a backup factor, a lens design will be procured from an independent source which will be evaluated along with the Itek design. This will be carried only to a stage sufficient to determine feasibility and image quality.

A technical summary will be prepared at the end of each month. A preliminary lens design and tolerancing analysis will be presented at the end of the third month. A final report will be supplied at the end of the sixth month covering all design and analysis carried out. Continuous system analysis and consulting services will be supplied to the project and to the optical manufacturing departments.

The preliminary design will be satisfactory for prototype fabrication of elements. The final design shall incorporate all features appropriate to production quantities.

We have studied the effects of thermal gradients and their optical effects on flat windows and these investigations will be extended to cover the heat transfer to and through the faces and of the aspheric corrector plate. Calculations will be made of the defocusing and aberration effects of uniform temperature excursions to determine the degree to which such effects can be tolerated in operation.

The thermal analysis capability of the Vidya Division of Itek will be utilized to predict the effect on the optical elements of albedo and other thermal disturbances.

3.1.2 Fabrication

The two plate ribbed primary mirror, the folding mirror, and the aspheric plate are of a sufficiently critical nature and present enough unique fabrication and mounting problems to warrant Itek proposing the fabrication of prototypes of these elements and the cells required to mount them to the optical bar proper.

Investigations into materials and structures, as well as fabrication, assembly and test techniques will be conducted to assure optimum selection of components and manufacturing methods conducive to as efficient a production schedule as is feasible for systems of this type. The use of cast-in-place epoxy locating shoulders, foamed-in-place resins and elastomeric mounting will be examined for suitability of application.

3.1.3 Optical Testing

Itek will generate a test plan and carry out such tests as are required to assure optical, mechanical, thermal and operational integrity of the individual element-mount combinations. Ritchie tests using laser interferometric techniques will be utilized in the testing of the folding mirror.

3.2 One Third Focal Length System

3.2.1 Design

Itek will design a Schmidt-corrected catadioptric 60-inch $f/3.0$ optical system suitable for use in a panoramic system which is to be rotated about an axis located 20-inches behind the node of emergence.

3.2.2 Fabrication

Since the optical fabrication problems associated with this camera design are essentially the same as in the optic bar design no element fabrication is necessary.

3.2.3 Testing

Tests similar to those predicated in 3.1.3 would be utilized to check the Schmidt plate.

TASK 4. FACILITIES STUDY

The purpose of this task is to survey Phase II facility and equipment requirements for environmental test, project administration and engineering, fabrication, assembly, field service, and mission support. Particular attention will be given to leasehold improvements and government furnished equipment. Any long lead items which might delay scheduled delivery of operational equipment will be identified to the contracting agency as soon as they are evident.

Specifications for facilities and equipment will be prepared in sufficient detail to obtain cost and delivery quotations from vendors and provide a basis for equipment procurement and detailed design of special purpose installations.

Schedules and costs of facility construction and furnishing, including pertinent backup data, will be developed and presented in a summary document.

5.1 System Dynamics

Determination will be made of the magnitudes and frequencies of the disturbing forces and torques and their effect on camera structural distortion to ascertain the resulting focal shift, and/or synchronization errors and craft reactions. The effects of gyroscopic torques, momentum and dynamic unbalances and mechanism accelerations will be evaluated. The analysis will be utilized in the selection of configurations, choice of materials and the determination of required structural stiffness as well as in the evaluation of system performance.

5.2 Optics

We will maintain quantitative knowledge of all optical factors which affect system performance. The following factors will be determined:

The size and shape of the central aperture obstruction of the system

The optical transfer function of the system

The T-stop of the system

Straylight or veiling glare in the system

In addition to maintaining the best possible current record of these quantities, camera designers will be given all inputs to ensure that optimum light baffling and straylight trapping procedures are used, and that the best mounting methods are employed.

Film marking and an associated detection system for locating film position will be investigated and evaluated.

Knowledge of all film factors which will affect photographic performance of the system will be maintained.

A record of the current expected exposure time will be kept for the system.

Design engineers will be kept informed of important factors which will affect the performance of the film under operational conditions.

Factors pertaining to the interaction of the film and the mechanical transport system will be analyzed.

5.4 System Performance

An analytical determination of the resolution and modulation transfer functions of the basic optical system and the effects of vibration, focal shift, synchronization error, image motion compensation error, distortion of the lens, and their combination with the film transfer function.

Experimental determination made of the subsystem performance will be compared with the allowable values in the error budget. Subsystem performance will be utilized to provide a prediction of system resolution and modulation transfer function. An experimental determination of system resolution will be compared with the predicted values and deviations will be investigated.

TASK 6. PROGRAM ANALYSIS

This task consists of a continuing analysis of total program requirements for Phase II. This task will be closely coordinated with and complementary to Task 4. Areas which will be considered include: development and production organization; procurement, fabrication, testing, and material handling problems of a special nature; field service requirements; and comprehensive program schedules. Particular emphasis will be placed on the development of realistic schedules and identification of critical long lead items. Items which could jeopardize the schedule objectives of Phase II will immediately be communicated to the procuring agency.

The information generated in this analysis task will provide the foundation for a realistic and comprehensive program plan for Phase II, and minimize the possibility of unanticipated developments.

B. DELIVERY

Contractor shall make delivery of the materials and data as set forth herein below:

<u>Description</u>	<u>Delivery Date</u>
a. Brassboard of constant velocity film transport system suitable for optical bar type panoramic system and incorporating optic bar bearing system.	1/31/65
b. Evaluation report of the performance and operational feasibility of Item 1.	1/31/65
c. Task 5 Summary report giving a detailed report of the system analyses.	1/31/65
d. Preliminary interface specification defining the optical bar camera system envelope, weights, power requirements, and other camera system spacecraft interface factors.	11/16/64
e. Full scale wooden design mockup of the complete optical bar camera system in a space frame representing the vehicle.	1/31/65
f. Report summarizing the optical bar camera design.	1/31/65
g. Engineering specifications for the fabrication of the optical elements.	9/30/64
h. Interim report covering the design and expected performance of the optical systems.	9/30/64
i. Prototype elements of the optical bar system to include one each Schmidt plate, primary mirror and folding mirror consistent with the requirements of the lens design.	1/31/65

- j. Final optical design report 12/31/64
covering all aspects of the optical design and fabrication studies and stating requirements for putting the designs into production.
- k. Report on Analysis and Testing 1/31/65
of Gaş Bars.
- l. Report on Film Steering. 1/31/65
- m. Report on Intermittent ~~Film~~ 1/31/65
Film Drive Design.
- n. Summary Report on 1/3 focal 12/31/64
length system.
- o. Report summarizing the 1/3 12/31/64
focal length camera design.
- p. Report of facility require- 12/31/64
ments, costs, schedules, and specifications for their construction.
- q. Program Plan for Phase II 1/15/65
- r. Final Summary Report Phase I 1/31/65

APPENDIX II

Contract MB-1957

Work Additions or Modifications:

1. Itek will perform an analytical study on the feasibility of using gas lubricated bars for support of the film wherever the sensitized emulsion must face a support roller or where a skew turn would be advisable in order to decrease equipment size. A breadboard will be constructed incorporating several skew and non-skew gas bars which will allow an experimental validation of the analysis and serve as a testing system for various roller gas bar configurations and film paths.

Itek will subcontract to Franklin Institute a backup analytical study of gas supported film.

A statement of the results of the analytical studies and breadboard experimentation will be included in the Phase I final report.

2. Itek will investigate methods of film steering which will be available in the eventuality of difficulty in film transport. The technique used would be essentially that of a servo system which would sense the film edge position and orient a pair of gas bars to correct drifts in film tracking without producing transients prohibitive to image quality. A breadboard will be constructed to test the practicality of the device.

3. The continuous film drum drive as presently conceived has been designed so that it is amenable to modification for use in an intermittent film drive system. Itek therefore proposes that a design be carried out on a non-interference basis that would allow the continuous transport brassboard to be later altered to develop the intermittent method of film transport.

4. A new task group is proposed (Task 7 - Interface Liaison) whose responsibility will be that of maintaining contact with the SEAC and associate contractors

to ensure proper coordination of the camera system with the other components of the reconnaissance system. It is proposed that this group meet periodically with similar groups from the other associates to form an interface board which will work with SEAC in keeping all interface considerations updated.

5. Personnel had been "on loan" from another company project to work on the facility study. These personnel have now been recalled to their home project and a small group from the deleted Task 2 will be assigned to carry on the remaining work.