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4 November 1965

MODULATED-LIGHT SYSTEM PROGRAM INFORMATION SHEET

1. INTRODUCTION

1.1 The Government intends to award a prime contract for research in the theory and methods of viewing and reproducing photographic transparencies by means of modulated illumination as it relates to the exploitation of imagery.

1.2 Prospective contractors, in response to this program, are invited to submit proposals based upon the written requirements and information obtained from the Bidders' Conference. We are particularly interested in your attitude regarding the use of consultants, sub-contractors and associate contractors.

1.3 The scope of this research program will encompass a complete plan for theoretical analysis, feasibility study, and engineering development of equipment which will satisfy the technical requirements outlined in section 3 of this paper. In evaluating the proposals, special attention will be placed upon the contractor's plans to bring a broad spectrum of analytical effort to bear on the problem, emphasizing the use of consultants, sub-contractors, and associate contractors while minimizing the strictly proprietary capabilities and points of view of the prime contractor.

2. ADMINISTRATION

2.1 This program requires the Prime Contractor to manage all aspects of the research and development of modulated light system commensurate with advances in acquisition systems and exploitation requirements.

2.2 The Prime Contractor is expected to obtain technical aid from leading authorities in the field whenever aspects of the program require knowledge or development beyond the scope of his normal capability.

2.3 The Prime Contractor is expected to provide the Government with research and development support which will lead to successful new techniques and equipment derived from the field of modulated light as related to imagery exploitation processes. He shall investigate through studies, tests, and fabrication of equipment where necessary, new methods and devices which will further the state-of-the-art in imagery exploitation techniques.

2.4 In submitting proposals, the Prime Contractor shall also include:

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2.4.1 Planned division of the program into major phases and categories.

2.4.2 Schedules of work for each division.

2.4.3 Statement of experience and results of previous sub-contracting.

2.4.4 Plans for using sub-contractors with a list of prospective sub-contractors.

2.5 The Government will evaluate the proposals on the basis of awareness and comprehension of the problems and potential of modulated-light illumination, the techniques through which the proposal approaches the objectives and the level of commitment to the success of the projects proposed.

2.6 Although the Government has planned this program on a five-year basis, the Government is in no way obligated to carry out a series of contracts throughout a five-year period; the actual time phase of the program will be determined by a contractor's performance and the continuing relevance of the requirements.

2.7 Since the Government is aware of the great breadth of this program, guidelines will be given to delimit areas of prime concern. The basic rule is to limit research to those areas which promise answers to actual operational problems at NPIC and which will ultimately contribute directly to the improvement of modulated-light illumination processes at NPIC. Accordingly, the proposed research plan should reflect: (1) a thorough comprehension of the areas of prime concern, (2) proposed solutions to problem areas and a delineation of those areas requiring investigation; (3) the probability of success, and (4) the schedule of major events. Intermediate prototypes will be developed to prove the applicability of concepts and provide a test bed for evaluating applicability to operational situations. The proposal should include a selection of those approaches which offer the most potential for development within realistic time frames.

2.8 If representatives at the Bidders' Conference have Agency approved facilities for storage of material classified SECRET, they may take this paper with them. At the time of the submission of the proposal it should be returned together with the basic materials already forwarded with RFP No. RD-6-66. If the company does not elect to submit a proposal the materials must also be returned in the same manner.

3. ~~TECHNICAL REQUIREMENTS:~~ Because reconnaissance photographs must be taken under a wide variety of light conditions, parts of pictures are often locally over-or-under-exposed. Even when wide-latitude films are used, nearly every picture typically shows dense shadows in which no detail is visible. Sometimes part of the detail in a shadow can be

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recovered by special photographic processing; for example, a very short exposure on high-contrast print paper will often make obscure shadow-detail visible at the expense of the pictorial quality of the rest of the picture. In essence, the central technical requirement of this program is to develop methods of presenting a picture to a photo-interpreter in such a way that all of the information the picture contains is made visible. As a starting assumption this implies that the illumination in a contact photographic printer, an enlarger, or a light-table should vary from point to point in such a way as to compensate for deficiencies in the picture which hinder perception of the image. The Log-Etronic printer is an example of such a device. The needs of the Government, though, extend far beyond present-day practice.

3.1 The fundamental criteria of perception as they apply to photo-interpretation must be investigated. Already, a great body of theory and experimental data have been produced by many different workers. A thorough synthesis of past experience will point to questions which must be solved before intelligent design of operational modulated-light equipment can be started.

3.1.1 This part of the study must be integrated with the Government-Sponsored [REDACTED] Program. Liaison between the modulated light contractor and the [REDACTED] contractor will be maintained through the respective contract monitors.

3.2 Based upon the results of the psychophysical studies, the technical aspects of the problem can then be approached. Methods of sensing the local density of a photograph, of controlling the illumination, and of presenting the corrected picture of the observer must be perfected. In particular, the Government is interested in the following classes of equipment:

3.2.1 High-resolution modulated-light contact printers capable of printing-out resolutions at least twice as fine as produced by automatic-dodging printers now on the market.

3.2.2 High-resolution modulated-light enlargers with similar capability.

3.2.3 Modulated-light direct-viewing light-tables on which positive transparencies could be viewed through a microscope at magnifications up to 100X.

3.2.4 Modulated-light rear-projection viewers capable of handling film-widths of up to $9\frac{1}{2}$ inches and with overall magnifications of up to 30X.

3.3 Technical responsibilities of the contractor include the following:

3.3.1 The prime contractor, his sub-contractors, and consultants shall be responsible for keeping the Government advised at all times of not only his own progress but also of the progress of others whose work in this field may come to his attention.

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3.3.2 The prime contractor will aid in defining specific development goals. The Government, through its technical representatives, will provide the basic requirements; the contractor will advise in reducing these to specifications for individual pieces of equipment.

3.3.3 The prime contractor must provide the overall technical management of his sub-contractors and consultants.

3.3.4 The prime contractor must devote enough of the effort to literature study to insure that his work does not duplicate that of others.

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