25X1A

TCS-716/004-77

August 1977
TP-2-008

Technical Proposal

OIA SUPPORT SERVICES

Submitted to

Office of Imagery Analysis

Submitted by

25X1A

[redacted]

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Approved For Release 2002/06/13 : CIA-RDP80T00703A000400060001-2

FOREWORD

25X1A [redacted] is pleased to submit this unsolicited proposal for technical photogrammetric support to the Office of Imagery Analysis at the National Photographic Interpretation Center. For over

25X1 ten years [redacted] personnel have been providing photogrammetric support to the Photogrammetry Division of the Technical Support Group at NPIC. This support has included performing the mathematical analysis, writing the computer programs, installing them on the NPIC computers, training NPIC personnel in their use, and performing data reductions on a wide range of photogrammetric problems from sophisticated satellite reconnaissance photographic systems to the more conventional hand-held terrestrial photography. Other support work has included photogrammetric instrument design, test and evaluation, mensuration instrumentation calibration, field ground truth collection and documentation, preparations of P.I. keys, and special system studies.

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1. INTRODUCTION

1.1 Background

25X1A [redacted] was founded independently in 1957, offering research and development services in the then new and exotic field of remote sensing. In 1962, [redacted] 25X1A

25X1A [redacted] and maintained as a wholly-owned subsidiary... [redacted] 25X1A

25X1A [redacted] now offers a full range of services in three related technical areas: photogrammetric engineering and mapping; remote sensor image interpretation and analysis; and map based information systems. Most of the same individuals, equipment and capabilities developed when [redacted] 25X1A continue with the new entity of [redacted]

25X1A Personnel of [redacted] have been involved in the design, evaluation and reduction of conventional and unconventional photogrammetric systems for almost twenty (20) years. They have been involved in the reduction of satellite imagery from the beginning of the space program. A major effort was spent in designing the RECAP program for the Army Map Service for the reduction of KH-5 material. For the Lunar Mapping Program, [redacted] personnel set up the Lunar 25X1A Mapping Laboratory of NASA at Houston, Texas, and supervised and staffed this entire effort.

Currently [redacted] 25X1A

25X1A [redacted]

25X1A [redacted] has a professional staff of nearly forty (40) individuals with expertise in various aspects of reconnaissance system data reduction and exploitation. Personnel include

senior and junior level Photogrammetrists, Mathematicians, Computer Programmers, Photo Interpreters, and Instrumentation Engineers as well as the necessary support staff. Almost all of the staff have at least a TOP SECRET clearance with access to SI/TK material. Where required, special level clearances are possessed for work on the latest programs.

The facility itself has a work and storage area dedicated to SI/TK material exploitation. Current major programs include:

1) A photogrammetric support group at NPIC performing computer programming, data reduction, and analysis on [redacted] and terrestrial photography, mensuration, instrumentation calibrations and acceptance testing, and ground truth collection and documentation. 25X1D

2) A mathematical modelling and computer programming group at the Naval Intelligence Support Center preparing mathematical models and computer programs to [redacted] in both mono and stereo including full error propagation. They have designed and developed a large block photogrammetric reduction program which may be used for conventional photographic imagery. In addition, they have designed and installed the necessary hardware and software for a twenty terminal real-time mensuration system. 25X1D

25X1D [redacted]

5) Special studies such as:

- Point transfer techniques on Analytical Point Positioning Systems (APPS)

- Impact of near-real-time systems on exploitation facilities
- Design of map update capability for Engineer Topographic Units
- Use of mensuration on unconventional reconnaissance material.

25X1A As can be seen, [redacted] personnel are at the forefront of current photogrammetric problems.

2. TECHNICAL APPROACH

25X1A [redacted] proposes a time and materials (T&M) type contract to OIA as being the most suitable for their needs. A given funding level may be designated by OIA, and a contract written not to exceed this amount. Then, as tasks are defined, personnel can be supplied to carry out the work. [redacted] personnel are available to handle any and all aspects of standard and special photogrammetric mensuration and data reduction. This could range from supplying skilled mensuration technicians to perform mensuration on 25X1A

25X1D [redacted] on the Center's equipment and using the Center's Real-Time Mensuration Programs, to performing any or all aspects of complex data reduction using [redacted] own block adjustment programs. This latter effort could include just the mensuration, or include the complete data reduction using computer programs with error propagation and, if desired, preparations of all or part of the reports, complete with line drawings. 25X1A

25X1A Currently, [redacted] personnel are engaged in placing a large block adjustment computer program (GIANT) on the Agency's IBM System 360 computer. This program, which has the capability of processing data from a block up to one hundred photographs, is used mainly for detailed study of clandestine terrestrial photographic projects. The Time and Materials contract which has been used to support the Photogrammetric Division at NPIC for over ten years, has come to an end at the end of September 1976, and this support will no longer be available to NPIC under the old procedures.

25X1A [redacted] proposes to make this same team, with over twenty years cumulative experience in dealing with NPIC's photogrammetric problems, available to OIA in support of their specific 25X1

problems. The team consists of [redacted] 25X1A with support provided by junior level staff. In addition, in depth support and advice can be provided by a very strong photogrammetric group which has been working on problems similar to those faced by OIA at the NISC. This team is lead by [redacted] 25X1A who has his Ph.D. in photogrammetry and is ably supported by a number of computer programming specialists and junior personnel.

Under a Time and Materials contract, OIA may contract for as much or as little work as is desired. Again, [redacted] 25X1A personnel may do as much of a job, including essentially all of it, including writing the final reports and preparing briefing boards, or as little as is desired. What we would like to propose here is the following:

One individual, nearly full-time, to act as designer, instructor, and executer of special photogrammetric problems with hand-held and block type reduction projects. He is familiar with all of the problems, and able to lead a complex reduction project associated with special technical intelligence problems.

One individual, part-time, to oversee the needs of OIA and that the best resources available are being applied to the job.

Several individuals, on an as needed basis, to serve essentially as mensuration technicians, draftsmen and general performers of the mensuration tasks.

If OIA would like to partake to the latest data reduction programs, used to reduce hand-held or block type data, work would need to be expended to finish putting these in a format easy to use

at the OIA area. A block adjustment program, when operating on the Headquarter's IBM System 360 computer could be accessed for most of the data reduction by the CRT/Teletype terminals within the OIA area. Although this capability is not currently in the program it could be added. It is proposed initially to make one person available, full-time, to get the computer programs up and running to do the job OIA requires to be done.

25X1A [redacted] is pleased to offer the services of
25X1A [redacted] initially full-time, to review the proposed work, direct the individuals in their specific tasks, and modify the computer programs to make them fully useful to the OIA requirements. Later he would spend a limited amount of time ensuring that the best resources are applied to OIA's needs.

25X1A [redacted] is proposed, part-time, to direct and oversee the special hand-held and block data reduction problems for OIA. He is quite familiar with all of the programs developed by [redacted] 25X1 over the years, and currently employed in the NPIC Mensuration Branch and at NISC.

[redacted] 25X1A
are proposed on an as needed basis in order to perform the actual mensuration and prepare the engineering drawings where required.

In addition, the consultant service of [redacted] 25X1A
25X1A [redacted] would be available as the need arose. He along with a skilled team of computer programmers, is working at the forefront of the most precise data reduction programs, prepared for classified imagery to date. These programs and this team would be available as special requirements emerged at OIA.

Others, as detailed in the resumes included at the end of this proposal, could be made available in addition to those already specified.

In order for you to be able to estimate the cost of a particular level of effort, the following forword pricing rates are given below. These should only be used for budgetary purposes; final rates will be agreed to during contract negotations. However, barring any unforeseen delay in the start of a contract, the negotiated rates should be close to those given below:

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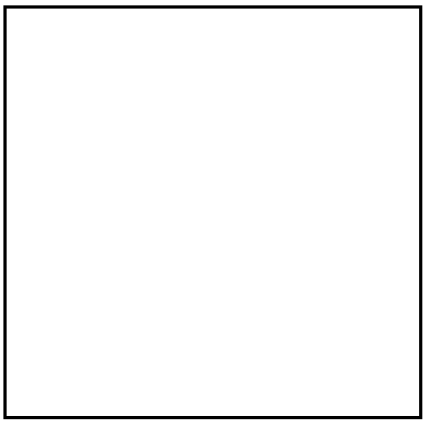

Category
Consulting Scientist
Principal Scientist
Senior Scientist
Scientist
Associate Scientist
Senior Technical Clerk

3. STATEMENTS OF QUALIFICATIONS

25X1A

STATEMENT OF CAPABILITIES

IMAGERY EXPLOITATION

INFORMATION EXTRACTION

25X1A

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1. BACKGROUND

25X1A [redacted] was founded independently in 1957, offering research and development services in the then new and exotic field of remote sensing. In 1962, [redacted] became part of [redacted] In 1977 the [redacted] was purchased by [redacted] and maintained as a wholly-owned subsidiary.... [redacted] now offers a full range of services in three related technical areas: photogrammetric engineering and mapping; remote sensor image interpretation and analysis; and map based informations systems.

2. CAPABILITIES

25X1A In it's field, [redacted] provides the link between user requirements and system hardware/software design which is essential to effective development of reconnaissance/remote sensing/mapping systems and is becoming increasingly important as systems and potential users proliferate.

Whether in system development or application, a user faces two basic problems. He must (1) select and develop the reconnaissance/remote sensing system with the greatest Information EXtraction potential for his purposes, and (2) employ the Imagery EXploitation technology through which this potential can best be realized. Only when the IEX functions are successfully exercised at all stages of research, development, test, evaluation, and operational application are remote sensing systems optimized or optimum information products generated.

25X1A [redacted] focuses on these IEX functions for its clients, providing superior qualitative and quantitative image analyses and evaluations, exploitation system designs and development, and associated data processing and software systems which are both cost-effective and fully responsive to user technical requirements.

In almost two decades of highly varied activity in the remote sensing 25X1A field, [redacted] has developed expertise in dealing with frame, panoramic and strip cameras; the full range of photographic film types; infrared imagers; brute-force, coherent side-looking and spotlight radars; electro-optical systems; laser imagers; and other multi-spectral sensors. We have worked successfully for and with military, governmental and commercial organizations alike. Figure 1 shows where Autometric Incorporated brings its expertise to bear in the reconnaissance/remote sensing chain. A representative list of clients is presented in Table 1.

3. ORGANIZATION

25X1A The [redacted] staff, numbering approximately forty, is made up of scientists, engineers, and skilled technicians drawn from the primary disciplines necessary to successful pursuit of our role in the remote/sensing/reconnaissance cycle. Specifically, the human resources which [redacted] can 25X1 bring to bear on military, intelligence, and civil applications programs include the following:

- Imagery Interpreters
- Exploitation Systems Engineers
- Human Factors
- Geoscientists
- Photogrammetrist/Mensuration Specialists
- Computer Systems Analysts/Programmers
- Intelligence Analysts
- Mapping/Civil Engineers

This interdisciplinary staff, acting together within the flexible management structure shown in Figure 2, assures the ultimate information user that all aspects of his particular remote sensing or reconnaissance problem are fully considered, and properly weighed and balanced against one another. This, in turn, ensures technical and cost-effectiveness in the design or application of the acquisition, processing or exploitation system.

An example of the successful transfer of remote sensing research into superior system development is the Analytical Photogrammetric Processing 25X1A System (APPS). [redacted] pioneered in the evaluation and special software

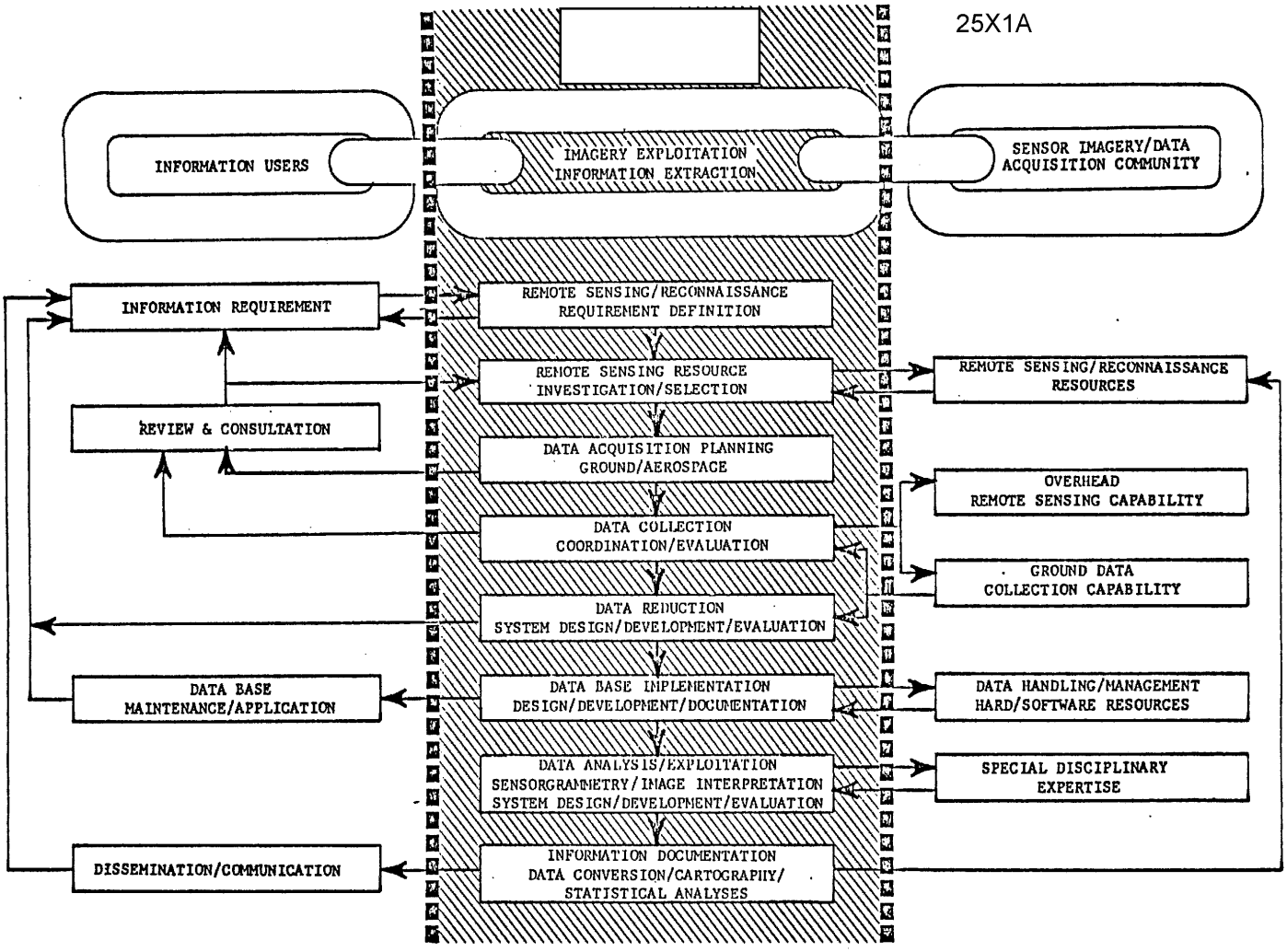

FIGURE 1 - THE REMOTE SENSING/RECONNAISSANCE CHAIN -

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development for this Army system utilizing a variety of remote sensing/ reconnaissance inputs. [redacted] now has total responsibility for all APPS software, hardware, and map based information system developments. This currently includes complete APPS development for wetlands mapping of the U.S. for the Department of Interior/Fish & Wildlife Service as well as for other Army, Airforce, and Navy Military applications.

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Through years of national and international experience, [redacted] has also developed a network of professional industrial and academic associations in the disciplines which immediately support or utilize our technology, such as ground data collection and surveying, aerial and space photography, remote sensor imagery and data collection, instrumentation, geology, geomorphology, and digital and electro-optical equipment manufacture, to name a few. When programs require it, we also provide products and services drawn from such disciplines on the basis of rigorously specified sub-contracts with firms and individuals pf proven capability and integrity.

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[redacted] as a "high technology" entity, is also organized for, and committed, to the orderly transfer of technology for the benefit of all elements of society. Thus, we have been active in making state-of-the-art military remote sensing reconnaissance technology, imagery, and extracted information economically and technically useful for civilian purposes. For instance, [redacted] has pioneered in the declassification of side-looking radar, infrared, and photographic sensor systems and imagery; and their transfer to civil uses in programs of mapping, resource and environmental management, arms control, and disaster assessment.

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4. FACILITIES AND EQUIPMENT

[redacted]

In support of its programs in remote sensing research, photogrammetric engineering, and geographic information system design and development, the 25X1A [redacted] facility contains appropriate imagery and date exploitation equipment. Included are stereo and monoscopic imagery viewers, a [redacted] comparator 25X1A with digital readout, a micro-densitometer/isodensitracer, stereoscopic point transfer devices, layout tables, and secure working areas, storage vaults and files. The working laboratory is arranged to accomodate multiple projects at any level of security, and to provide appropriate spaces for interpretation and photogrammetric evaluation tasks; experimentation, and production tasks such as plotting, indexing, mosaicking and screening. Computers utilized, both at commercial and government agencies, include, among other, the CDC-6700 6600, and 6400 ; UNIVAC-1108 and 494; IBM-360 and 370; NOVA 1200; SEL 32/55; and HP 9810, 9830, and 21MX. These have been used for analytical photogrammetry, digital image processing, system simulation, and other reconnsiassance, intelligence, and remote sensor exploitation purposes.

25X1A [redacted] facility has been granted a TOP SECRET clearance by action of DCASR, Philadelphia, PA.

5. SUMMARY

25X1A [redacted] has been organized, staffed and equipped to offer remote sensing services in photogrammetric engineering; image analysis; development of computer software; image processing; and information systems at the highest levels of efficiency and economy consistent with technical excellance.

For further information about our capabilities, you are invited to 25X1A contact, [redacted] and to 25X1A visit our facilities in the [redacted]

25X1A [redacted]

6. EXPERIENCE

25X1A [redacted] contract experience is summarized in the following pages. Section 6.1 covers experience in general functional areas, citing selected projects by name, customer, period of performance and work synopsis. Section 6.2 contains a listing of classified and special security work which is applicable to the proposed OIA contract.

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SECTION 6.2

GENERAL

This portion of the Statement of Qualifications is presented to OIA in order to indicate the range of special security work and other contract efforts which are directly applicable to the proposed OIA support center.

These programs/studies primarily have been performed in connection with the National Reconnaissance Program (NRP) and, as such, relate to strategic high altitude (satellite and aircraft) operational and R&D reconnaissance programs.

PROGRAMS

25X1A [redacted] over the past 15 years, has performed supporting RDT&E in the exploitation area with the various Talent and Talent-Keyhole image-forming systems. This research has included both photogrammetric and photointerpretation areas and has been performed primarily for the National Photographic Interpretation Center and the U.S. Army. Some indication of the work conducted through 1973 is shown in Table 2.

25X1A More recently [redacted] has been working under contracts for the Navy Space Project Office (PM-16, now PME-106) and Naval Intelligence Support Center (NISC) in the exploitation of current and future KH systems from both an interpretation and photogrammetric standpoint. Additional contracts have been performed for other aerospace companies. Feedbacks have resulted, related to Naval collection system needs for ocean surveillance as well as the actual design and implementation of data handling systems. [redacted] 25X1D

25X1D [redacted] 25X1D

[redacted] Other similar special access evaluations and systems work is being, or expected to be, conducted in the radar, E-O, [redacted] 25X1D

In addition to DOD and Intelligence Community, separate studies have been performed for the Arms Control and Disarmament Agency where

25X1A [redacted] acted as expert consultants in the reconnaissance area for both SALT and MBFR potential applications.

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7. PERSONNEL

25X1 Resumes of [redacted] appropriate to this OIA proposal, follow.

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