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Final Report

**MAINTENANCE CAPABILITY EVALUATION OF
BANGLADESH SPACE RESEARCH AND REMOTE
SENSING ORGANIZATION AGRO-CLIMATIC/
ENVIRONMENTAL MONITORING PROJECT****BARRY D. MACRAE**
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1.0
EVALUATION SUMMARY

1.1 NAME OF MISSION AND TITLE OF EVALUATION REPORT

Mission: USAID/Bangladesh

Title: Maintenance Capability Evaluation of Bangladesh Space Research and Remote Sensing Organization Agro-Climatic/Environmental Monitoring Project (PIO/T 3880046310441)

Date: December 1985

1.2 PURPOSE OF THE PROJECT

The purpose of the project is to upgrade the capability of the Government of the Peoples' Republic of Bangladesh (BDG) to obtain, analyze, disseminate, and use agro-climatic and other remote sensing data in the management of natural resources, particularly those related to agriculture and water development. To achieve this purpose USAID is providing BDG's Space Research and Remote Sensing Organization (SPARRSO) with the equipment, technical assistance, and training necessary to collect, process, and employ modern remote sensing data, especially satellite data. These data are to provide information for improving the management of Bangladesh's various natural resources.

1.3 PURPOSE OF THE EVALUATION

This evaluation is to provide USAID and SPARRSO with a report prescribing a plan of action which will result in SPARRSO's developing a capability to keep the equipment obtained under the Agro-Climatic/-Environmental Monitoring Project (ACEMP) in good operating order. This report was to include the following:

- A detailed listing of and schedule for necessary maintenance for all data reception and analysis equipment.
- Detailed listing of and schedule for the organization and staffing of the equipment maintenance unit(s) within SPARRSO.
- Recommendations for additional and/or enhanced training for maintenance personnel (including recommendations as to where the training could be best obtained).
- Recommendations for provision by USAID for long and/or short term technical assistance to SPARRSO in the development of its equipment maintenance capability.

- Recommendations for utilization of in-country (non-SPARRSO) equipment maintenance services.
- Recommendations for utilization of repair and maintenance services outside of Bangladesh (i.e. from India, Singapore, U.S., etc.).
- Recommendations for development of a spare parts (and expendable supplies) procurement system for parts and supplies needed both on a routine and emergency basis. (Use of both Bangladesh and U.S. private sector procurement services are discussed).

1.4 KEY ISSUES AND QUESTIONS

Questions that must be answered in order to meet the Evaluation's objectives include:

- What is the current status of the project implementation?
- What is the current status of routine and remedial maintenance procedures?
- What is the organization and staffing of SPARRSO's facility operational and maintenance unit(s)?
- What training has been provided to the maintenance staff and how well was this training assimilated?
- What are the capabilities of in-country (non-SPARRSO), regional, and U.S. repair and maintenance services for support of SPARRSO's maintenance requirements?
- What are the current practices with regard to spare parts and expendable supplies procurement?
- In each of these areas, what are the constraints which would prevent SPARRSO from adequately maintaining the facility equipment?
- What actions or resources are necessary to overcome the constraints identified above?

1.5 TYPES AND QUALITY OF EVIDENCE

The primary evidence used in the evaluation is on-site observations and interviews with SPARRSO personnel over a period of six (6) weeks

(two 3 week trips to Dhaka). The condition and operation of the facility were observed and staff members were requested to fill out forms relating to current and anticipated maintenance procedures and previous training experiences.

The Evaluator was assisted in the assessment of current maintenance procedures by Mr. James Jones of Purdue University, who had been retained by UNDP/FAO to perform a similar maintenance capability evaluation by that organization. Mr. Jones generated forms and conducted extensive interviews with the maintenance personnel. His comments on the results of these interviews were extremely helpful in determining required changes in current procedures.

The forms which were circulated requesting information on previous training of SPARRSO personnel and their perception of current and anticipated responsibilities within the organization, coupled with subsequent interviews with selected personnel, provided the basis for organizational structuring recommendations.

Observations made during the operation of a maintenance "task force" established by SPARRSO also provided valuable insight into the current SPARRSO structure and potential strengths in a revised structure.

During the first trip, discussions were held with SPARRSO financial personnel to determine problems associated with the acquisition of spare parts and expendable supplies within the framework of the BDG import restrictions.

Trips were taken within the U.S. to various procurement service organizations to obtain information on their experiences with providing goods and services to countries similar to Bangladesh. As a result of these trips, representative service agreements were obtained and used to formulate the recommendations regarding parts procurement and supportive services.

Observations made during the second trip to Dhaka, after the equipment had been installed, provided additional insight into operational as well as maintenance problems and led to the final recommendations stated below.

Trips were taken to local (Dhaka) agents during the second trip to identify local sources for goods and services. The information gathered during these trips, in conjunction with information gathered during the U.S. trips, resulted in several recommendations below.

Finally, valuable inputs were provided both by Fabian Polcyn (ERIM) and Mel Chatman (USAID) based on their long and constant association with SPARRSO in the implementation of the project to its current level.

1.6 FINDINGS

1.6.1 BASIC FACTS

1.6.1.1 Basic Facts

To date, USAID has provided approximately \$5,350,000 and BDG has provided, through SPARRSO, approximately \$2,890,000 for this project.

In 1980, under a Participating Agency Service Agreement (PASA), USAID contracted with NOAA to implement the ACEMP in Bangladesh. The goals of the project were evaluated by NOAA and the contract was sub-PASAd to NASA and ultimately assigned to the Goddard Space Flight Center, Greenbelt, Maryland. Mr. Charles Vermillion was appointed Project Officer.

The primary responsibilities for the project resided in the Goddard Program Office and included:

- Overall program coordination,
- System design,
- System specifications,
- System integration and,
- Shipment of system to Bangladesh.

Science Systems and Applications, Incorporated (SSAI) was awarded a major subcontract to provide the following goods and services:

- Site preparation (UPS, A/C, etc.),
- Procurement of all equipment,
- Procurement and/or development of all software requirements and,
- System installation in Bangladesh.

Louisiana State University (LSU) was contracted to provide specialized software and training to SPARRSO personnel for the use of Tiros AVHRR and Landsat MSS data in both meteorological and land use applications.



The University of Wisconsin (NOAA/CIMMS) was awarded a contract for the delivery of Tiros Operational Vertical Sounder (TOVS) software and training of SPARRSO personnel in its use.

1.6.1.2. Outputs

The five primary direct outputs of the project have been obtained. These include:

- Construction and staffing of the SPARRSO facility,
- The installation of the advanced meteorological groundstation,
- Deployment of eleven Data Collection Platforms (DCPs),
- Training of six SPARRSO personnel in the operation and maintenance of the equipment and,
- Routine provision of timely imagery and DCP data to BDG's Meteorology Department and Water Development Board.

1.6.2 COMPLEX FACTS

As stated above, the project has made significant progress in providing the BDG with the technical capability to acquire and utilize satellite data for meteorological and land use studies. Due to delays in the procurement and installation of the equipment, several of the institutional-building goals of the project have yet to be realized. The SPARRSO organization was not sufficiently prepared to accept the responsibility for the daily operation and maintenance of this equipment before the expiration of the current project funds.

1.7 CONCLUSIONS

The equipment installation and personnel training provided for under the project has been completed. In order that the project achieve its secondary goals of routinely providing services to various user agencies in the support of meteorological and land use studies in Bangladesh, additional institutional changes must be made in the areas of operation and maintenance of the facility's equipment.

1.8 RECOMMENDATIONS

SPARRSO must immediately accept, both mentally and physically, the responsibility for the operation and maintenance of the ACEMP facility. In order to meet the goal of full operational status of the facility, the following recommendations are made:

- SPARRSO should immediately implement an organizational structure that clearly identifies assignments and individual responsibilities.
- SPARRSO should implement Standard Operating Procedures (SOPs) for operation and maintenance of all facilities and the ACEMP equipment.
- SPARRSO should establish a parts and expendables procurement policy and contract with suppliers in order to assure timely procurement.
- SPARRSO should implement a computerized inventory control system.
- SPARRSO should establish an on-going training program for refresher and advanced training in the operation and maintenance of the facility equipment.
- SPARRSO should establish remedial maintenance backup for major system components.

1.9 LESSONS LEARNED

The transfer of high technology to developing countries is a very complex and time-consuming task. The problems in projects of this type usually arise from not assessing and adequately addressing the total systems aspects of the project. The system does not stop with the equipment and associated personnel but includes also the institutional structure which must support the facility. It is a common misconception that the institution fully realizes the implications of the sudden infusion of technology and has adequately prepared for the additional resources required.

Although this project was envisioned as institution-building, the facility management aspects of the project were neglected - there were no SPARRSO management personnel exposed to training in facilities performing similar functions to the ACEMP installation. In addition, SPARRSO has not recognized the organizational structure required for the management of such a facility on a routine basis.

In future projects of this nature, the full systems aspects should be examined and the recipient institution should be brought into the preparations for technology transfer much earlier in the project.

2.0 CONCLUSIONS AND RECOMMENDATIONS

2.1 SPARRSO ORGANIZATION STRUCTURE

- SPARRSO should immediately implement an organizational structure that clearly identifies assignments and individual responsibilities.
- SPARRSO should establish a management Standard Operating Procedure (SOP) for reviewing and grading individual performances based on their adherence to SOP guidelines. This should include regular monitoring of SOP implementation.
- SPARRSO should implement a reporting structure for equipment failures which guarantees rapid correction of the problem.

2.2 STANDARD OPERATING PROCEDURES (SOPs)

- SPARRSO should immediately implement SOPs for operation and maintenance of all facilities and the ACEMP equipment. The initial source for these SOPs may be the manufacturers' Operations and Maintenance manuals.
- Assign single responsibility for the implementation and utilization of each SOP.
- Insure that all persons responsible for performance of the SOPs have a copy of the latest version.
- Develop a procedure for regular review, revision, and distribution of all SOPs.

2.3 PARTS PROCUREMENT AND INVENTORY

2.3.1 SPARES

DEC

It is my recommendation that DEC spares, both under normal and rapid response procurement procedures, should be acquired directly from DEC's General International District facility located in the U.S. This would be one component of a multi-faceted contract with General International District (GID) to supply parts, including a rapid response capability; combination preventative maintenance/training trips; and remedial maintenance backup support. The maintenance activities will be discussed in later sections. A sample copy of such a contract is attached in Appendix C.

NON-DEC

SPARRSO should contract with a local Procurement Service Agent (PSA) to act as their agent in the procurement of goods and services up to a specified level of funding. This would allow SPARRSO to contract in local currency and let the PSA handle the currency conversion. A component of this contract would be the normal and rapid response procurement of spares. In cooperation with SPARRSO, the PSA would develop a list of potential suppliers and establish contact with these suppliers immediately. Upon notification by SPARRSO of the need for a particular part, the PSA would contact the supplier, handling all arrangements for shipping and currency conversion.

My recommendation for an organization to serve in the capacity of PSA, based on their past involvement with the project, is Kabir Brothers.

It is possible that SPARRSO could handle some small component of the spares procurement directly through the local market.

A copy of a typical U.S. PSA contract and a representative PSA terms of reference are attached in Appendix C.

2.3.2 CONSUMMABLES AND ADDITIONAL MATERIALS

Wherever possible consummables and additional materials would be procured directly by SPARRSO through the local market. A number of potential suppliers for items such as magnetic media (CCFs and floppy diskettes) and paper have been identified and are attached as Appendix B.

Where local sources do not exist, these materials could be procured through the contracted PSA described above.

2.3.3 SPARRSO'S RESPONSIBILITY IN PARTS PROCUREMENT

- SPARRSO should petition the Bangladesh Government to modify S.R.O. 42(R)/69 of the customs regulations, only exempting duties on goods imported from countries signatories to the UNESCO Agreement. Since the United States, no longer a signatory country, will be the primary source for materials to be procured, imposition of import duties will constitute a major expense and delay. SPARRSO should also investigate the privileges and limitations caused by the organization now being under the Ministry of Defense. Failing a satisfactory resolution of the UNESCO country restriction, arrangements should be made with the local PSA to trans-ship all goods

through a UNESCO signatory country. This may also impose additional delay and expense, however.

- SPARRSO should make arrangements with the customs organizations at ZIA and perhaps Chittagong for priority clearance of SPARRSO shipments. The rapid response procedure breaks down completely if parts are delayed upon arrival in Bangladesh.

2.3.4 INVENTORY CONTROL SYSTEM

- SPARRSO should immediately implement a computerized inventory control system. An appropriate data base management system (Profile) is currently operational on the project's TRS80 and should be utilized. Suitable data bases should be established for the following items:
 - Spare parts and consumables
 - Test equipment and tools
 - Manuals
 - Data tapes - digital and analog
 - Archival images

The implementation of the spare parts and consumables inventory is the first step in identifying potential sources for required materials. This will be a prime requirement for placing orders, either directly or through the local PSA.

These data bases should be regularly maintained through implementation of appropriate SOPs.

- SPARRSO should reorganize the current storage system to separate manuals and other materials.
 - Store manuals in a more appropriate location.
 - Move photographic materials to a temperature controlled environment.
 - Purchase or construct magnetic tape storage units. Place them in a temperature controlled environment and store all magnetic tapes in them in an appropriate manner. Location of individual tapes within the storage units should be identified in the computerized inventory system.
 - Devise appropriate storage for the archival images. Location of images within the storage should be identified in the computerized inventory system.

- SPARRSO should design and implement a materials transfer system to account for all dispersals from the parts and consumables inventory. Based on minimum stock levels, defined in the inventory control system, purchase requisitions could be initiated.
- If the inventory dispersal is for a major system component required due to system failure, initiate a repair request, either locally or through a foreign repair facility via an arrangement with the local PSA.

2.4 TRAINING

In general, it is my recommendation that virtually all operations and maintenance training in the near future occur on-site at the SPARRSO facility. SPARRSO now has a cadre of hardware and software personnel and they should be utilized to conduct inhouse training until such time as additional individuals can be identified who SPARRSO feels will improve the organization's capabilities through foreign training.

This recommendation does not include facility management training which should be accomplished by exposing management level SPARRSO personnel to operations of similar facilities in the United States and perhaps regional centers (India, Thailand, etc.).

2.4.1 DEC

- Directed Training

It is my conclusion that with regard to further training on the DEC hardware, the most effective method, both in terms of cost and current SPARRSO requirements would be to contract directly with DEC to provide a combination preventative maintenance/-remedial maintenance training through an on-site service arrangement. This is another component of the contract mentioned in the parts procurement section above. The agreement might provide up to four preventative maintenance trips per year with seminars on remedial maintenance of 3 - 5 days duration on two of the trips. This approach has four distinct advantages:

- SPARRSO is in an operational mode at this time and remedial maintenance is of extreme importance.
- These seminars will be conducted by experienced DEC Field Service Engineers who can impart very practical knowledge to SPARRSO maintenance engineers.

- A much larger number of SPARRSO personnel can be exposed to this knowledge.
- The DEC engineer can review the current preventative maintenance procedures and perhaps make suggestions for their improvement.

- Self Paced Instruction (SPI)

SPARRSO should make maximum use of Self Paced Instruction courses available from DEC, in particular "Introduction to Minicomputers" and "Introduction to Digital Logic". These courses should be presented to all interested personnel but particularly to those hardware people who have had no formal training in digital computer equipment and who are being considered for foreign training. A Course Administrator should be used and technical support from previously trained personnel should be provided to assist students when necessary. These courses provide four valuable functions:

- They serve as excellent introductions to more structured training, perhaps abroad.
- They provide an equitable selection criteria for choosing candidates for further training based on their expressed interest and demonstrated capability at an introductory level.
- They improve the absorption of future training because the students will become familiar with the computer vocabulary and the presentation of technical concepts in English.
- They can be presented at a pace appropriate to the students' abilities and they can be reviewed at any time.

2.4.2 NON-DEC

- Directed Training

Again, I would recommend that maximum use be made of on-site maintenance training. In at least two areas, the air conditioners and the ACEMP motor generator, local expertise exists and should be fully utilized. For other equipment, not supported through local expertise, I would recommend on-site seminars conducted by Field Service Engineers from the specific manufacturers, utilizing SPARRSO's equipment. This practical knowledge is much more valuable at this point in SPARRSO's development than additional "theory of operation" courses

normally taught at manufacturers' facilities. Much of the theory of operation can be acquired by knowledgeable hardware personnel through use of the equipment manuals now at SPARRSO.

Another important advantage to on-site training is that SPARRSO can monitor the progress of the training and use the evaluation of individual aptitude as selection criteria for additional training.

- Self Paced Instruction

All of the comments presented above are equally valid in this context. In addition, SPARRSO should consider the idea of purchasing courses which produce as a result of completion, valuable additional capital equipment (eg., oscilloscope, digital voltmeter, microcomputer). These courses not only provide a tangible result for successful completion but also provide valuable instruction in the troubleshooting of electronic equipment.

2.5 REMEDIAL MAINTENANCE BACKUP

In general, remedial maintenance support should only be requested after SPARRSO personnel have made a concerted effort to resolve the problem. There should be an established procedure (SOP), however, that insures equipment is not out of service for extended periods of time because of the inability of SPARRSO personnel to perform the necessary repairs.

If the inability to resolve the problem is due to lack of proper training, an important component of any outside assistance should be providing instruction to SPARRSO personnel to allow them to independently prevent or resolve the problem if it occurs again.

The SPARRSO personnel should actively participate in any repair process. This implies that on-site repairs should be conducted whenever economically feasible.

2.5.1 DEC

I would recommend that an additional component of the DEC contract mentioned above be an agreement by DEC to provide on-call remedial maintenance. This would provide a guaranteed response time and would also provide the best possible remedial maintenance backup and training of SPARRSO personnel on the SPARRSO hardware.



2.5.2 NON-DEC

As mentioned above, in the case of the air conditioners and the ACEMP motor generator local expertise exists and should be utilized. This local support should also include the active SPARRSO participation and training described above.

In the case of failures in other equipment SPARRSO will have to decide on the proper approach based on the availability of funds and required timeliness of repair. In an extreme emergency it may be possible to utilize funds allocated to the local PSA to contract on-site maintenance services from foreign organizations.

3.0 TECHNICAL ACTIVITY

3.1 INITIAL TRIP TO DHAKA (3/22 - 4/12/85)

During the initial trip to Dhaka, the ACEMP equipment had not yet arrived so the major thrust of the investigations included the following:

- What is the current status of routine and remedial maintenance procedures on the existing ground station?
- What is the organization and staffing of SPARRSO's operational and maintenance unit(s)?
- What training has been provided to the maintenance staff and how well was this training assimilated?
- What are the capabilities of in-country (non-SPARRSO) repair and maintenance services for support of SPARRSO's maintenance requirements?
- What are the current practices with regard to spare parts and expendable supplies procurement?
- In each of these areas, what are the constraints which would prevent SPARRSO from adequately maintaining the facility equipment?
- What actions or resources are necessary to overcome the identified constraints?

I was aided in formalizing the approach to answering these questions by the existence of a "task force" committee which had been established in anticipation of the equipment arrival. This committee had been suggested by USAID and implemented by SPARRSO just prior to my arrival. The avowed goal of this task force was to "Develop a viable SPARRSO system for operating and maintaining all equipment". The committee was broken down into the following Working Groups:

Working Group A - Ordering and Storage of Spares

Activity: Establish a computerized system for procuring and storing of spares, manuals, and reference catalogues.

Working Group B - Logistic Support

Activity: Establish administrative, financial, and shipping guidelines for a "quick response system" for parts replacement.

Working Group C - Maintenance Standard Operation Procedures

Activity: Establish Standard Operating Procedures (SOPs) for preventative maintenance, troubleshooting, and servicing of equipment.

Working Group D - Training

Activity: Identify training needs and organize training to meet those needs.

This task force forum proved very useful as an information gathering tool. Although some of the questions, such as facility management structure, were not being addressed; the questions of current maintenance procedures, parts procurement, inventory control and, training were. I participated in two sessions of the task force committee while I was there. This also helped to establish the proper SPARRSO personnel for my subsequent inquiries into other areas.

Mr. James Jones from Purdue University was also at SPARRSO during this period under a contract to UNDP/FAO. His contract terms of reference included: preparation of a maintenance schedule for all remote sensing electronic equipment at SPARRSO, hands-on training on the maintenance of electronic equipment and, preparation of a detailed list of equipment, materials, and further training required for establishment of an efficient in-house maintenance service for the remote sensing electronic equipment. Since his work appeared to parallel some of my anticipated effort, he very kindly allowed me to use information he gathered through interview forms to answer some of the questions on maintenance practices and previous maintenance training. This allowed me to expand my investigations into other areas of concern. Mr. Jones worked very closely with Working Group C during his stay there and made a very valuable contribution to their activities.

Mr. Harvey Carr had been retained by USAID to assist Working Group A in developing an inventory control system for the storage and ordering of parts. Mr. Carr was currently working at BARC as a vehicle maintenance supervisor and had experience in the development and implementation of parts inventory control for that purpose. He assisted the Group in the design of various forms which could be utilized in a computerized inventory control system. He also took the Group on a tour of two local parts storage facilities to illustrate how such a system can work. He and I collaborated on the design of a system for SPARRSO

and based on that design, a recommendation was made to SPARRSO for a Data Base Management System (DBMS) which can be implemented on the facility's TRS80 Model 16B.

I spent a great deal of time with Kamrul Islam, Chief Administrative Officer, discussing the problems associated with logistic support of facilities in Bangladesh. We reviewed SPARRSO's administrative and financial guidelines in this area and I obtained sections of the Customs regulations governing import of scientific equipment into Bangladesh. This information was later used, in conjunction with interviews with possible suppliers, to formulate a suggested procurement approach.

I also collected during this trip, through Working Group D, a set of forms circulated to all SPARRSO professional personnel which identified previous training and anticipated interaction with the ACEMP system. This was used to formulate training guidelines for subsequent implementation by SPARRSO.

A great deal of my time during this initial trip was spent in reviewing the SPARRSO organizational structure and assessing how this would impact the successful operation of the ACEMP facility. On paper, SPARRSO organization is as shown in Figure 1. This would appear to be a functionally-oriented structure in which projects would be administrated through project offices which would draw on resources from the various divisions (wings) as required. In reality, however, the organization operates as a project-oriented structure with the projects operating solely within a wing of the organization. Thus, the Landsat receiving system (French), UNDP program, and Met Ground Station operate under the direction of Dr. Pramanik, Director of Technology and the ACEM project operates under the direction of Dr. A. M. Choudhury, Director of Research. There is currently no Director of Applications. This causes some confusion in the management of resources, particularly personnel.

Based on this information, I developed a representative structure for the ACEMP Data Center which would service all wings of SPARRSO. This was presented to SPARRSO for their review and comments. This structure is attached as Appendix D. The initial reaction by Dr. Khan, Chairman of SPARRSO, when this was presented to him was that the reorganization was too radical and would cause considerable problems but SPARRSO agreed to review the document further after the equipment was fully operational.

To bridge the organizational gap during equipment installation and initial operation, I then suggested a counterpart assignment scheme utilizing the SPARRSO personnel who had been trained under the project and who would be required to assume the initial responsibility for the system operation. This paired SPARRSO personnel and SSAI personnel who

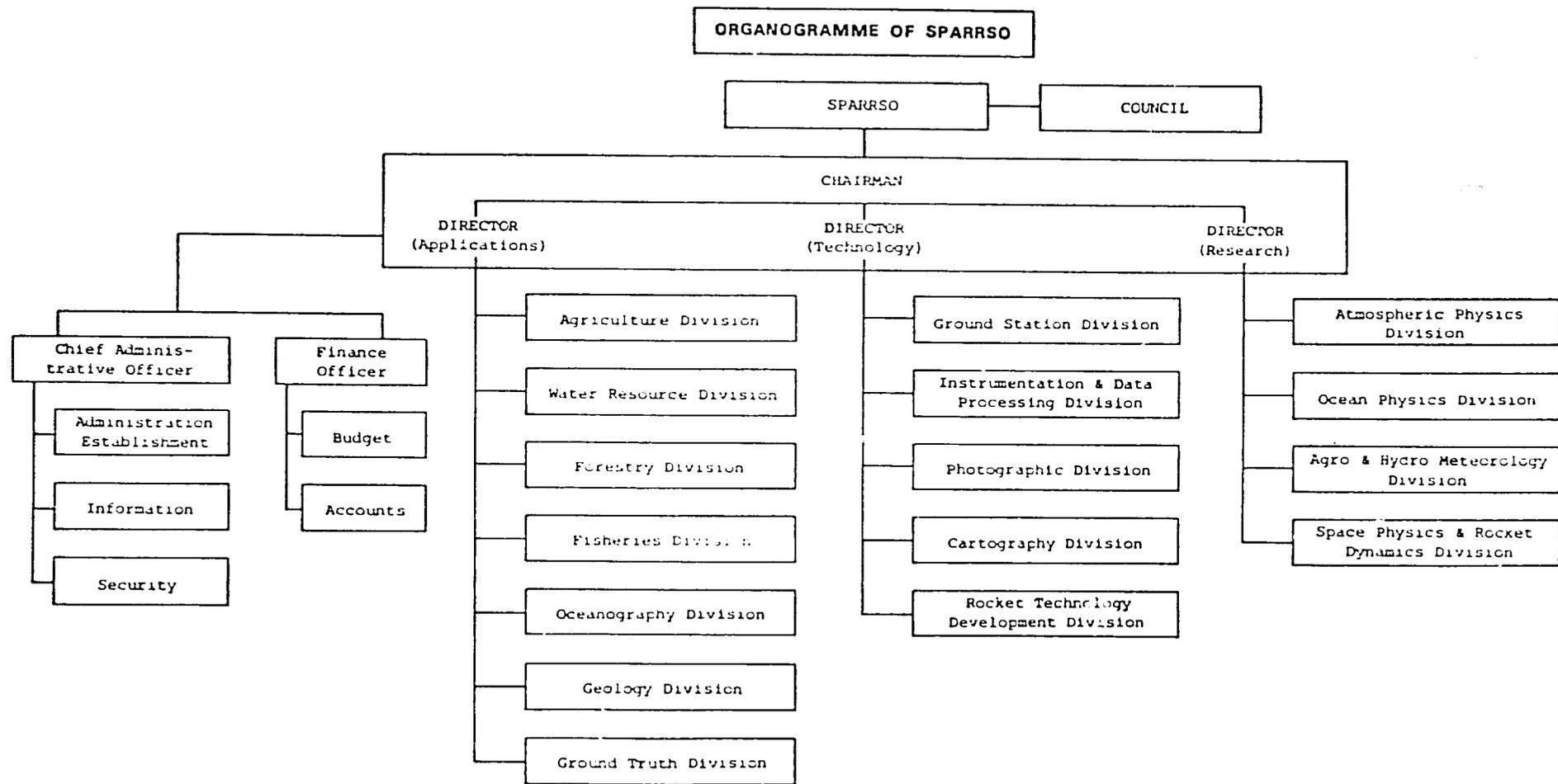


Figure 1. SPARRSO Organizational Chart

would be responsible for the system installation and testing. This scheme appeared to be acceptable to SPARRSO and was scheduled to be implemented upon equipment arrival.

The remainder of my time during the first trip was spent in investigating private sector support in Dhaka in the areas of maintenance, parts supply, and training.

3.2 U.S. TRIPS (8/19 - 8/23/85)

My initial U.S. trip was to Wimvex Associates, Ltd., Hopewell Junction, NY. This particular Procurement Service Agency (PSA) was chosen because of my past association with them and the knowledge that they had experience in providing goods and services in the Middle and Far East. They were very helpful in their discussions and they provided me with a typical PSA terms of reference which is attached in Appendix C. After much discussion, we agreed that without an open letter of credit in the U.S. the problems of rapid part procurement are very difficult if not impossible. This would require either SPARRSO or USAID to establish and maintain an open letter of credit during the period in which the U.S. PSA was required to perform. The only other option would be for the U.S. PSA to establish a counterpart organization in Bangladesh which could handle the currency exchange.

My second trip was to Digital Equipment Corporation, General International District, Acton, Massachusetts. There I talked with William Schaffer, Field Service Marketing Manager and Kathleen Twomey, Field Service Marketing Specialist. The discussions with this group covered the range of parts procurement, preventative maintenance training in Dhaka, and remedial maintenance backup support on the DEC equipment. A proposal encompassing all of these aspects had been presented to SSAI during the initial contract phase but had not been implemented. They presented me with a similar proposal and representative costs for various implementation options. The proposal is attached in Appendix C.

My last trip was to the South-East Consortium for International Development, Chapel Hill, North Carolina. I talked there with Harry Wheeler, Manager of their Procurement Department. This organization was chosen because of their recent very successful procurement program in Nepal and because of their experience with USAID procurement procedures. The same problems that were brought up in my discussions with Wimvex surfaced again and the comment was made by Mr. Wheeler that he thought the only viable approach for his organization was either a direct contract with USAID or a subcontract from a U.S. firm. He did provide me with a representative contract between his organization and USAID for procurement services. This contract is attached in Appendix C.

3.3 SECOND TRIP TO DHAKA (8/27 - 9/23/85).

My initial effort upon my return to Dhaka was to review how well the counterpart assignment scheme worked during equipment installation. It appeared that, with some minor exceptions, it was successful and the SPARRSO personnel had accepted responsibilities for operation and maintenance related to the initial counterpart assignments. There was still no formal organizational framework in place for the routine operation of the facility and I took the development of this framework as my prime responsibility at that time.

Based on a continued resistance to my initial organization, I developed a new structure more closely related to the realities of the organization but adding a facility manager (system in-charge) with individual duties and responsibilities tied to a SOP reporting system. This was reviewed by SPARRSO and was conditionally accepted.

At that point I reviewed the SOPs that had been generated since my last visit and suggested a more standardized form so that it was easy to modify the SOP based on increasing knowledge of the system operation. I also suggested that additional SOPs be generated covering the operational aspects of the equipment as well as the maintenance aspects. Once this idea was accepted, I suggested a SOP monitoring system which would allow determination of individual responsibilities and performance. Prior to my departure a relatively complete set of SOPs had been generated for both operational and maintenance aspects of the system.

I then suggested an initial assignment of additional SPARRSO personnel to be trained in the operation and preventative maintenance of the ACEMP equipment. After review by SPARRSO, this assignment structure was approved and presented to SPARRSO personnel at a formal meeting. This appeared to be the first time that any such formal structure was actually defined in writing. While it was not clear how well the structure would actually hold up in practice, the initial reception was mostly favorable. I would hope that this structure will be further refined as the facility becomes more fully operational.

The suggested DBMS for the inventory control function had been procured so I spent some time with the SPARRSO personnel demonstrating how it could be used for their various data management problems. By the time that I left they had begun inputting a spare parts list to test the system.

I then spent some time interviewing local sector suppliers to complete my investigation into the rapid part procurement issue. Local suppliers were identified which could supply most of the expendable supplies (computer paper, floppy disks, and magnetic tapes) and their

names were given to SPARRSO. I then interviewed Kabir Brothers, Ltd. - a local trading company with the idea of possibly using them to fill the parts procurement gap for other than DEC equipment. This organization has a U.S. office and can handle the money exchange without any problems. The organization also has a history with the project as they served as a local contractor for various facility implementation aspects. Based on these discussions, a meeting was held between Kabir Brothers and SPARRSO and a scenario was developed whereby Kabir could act as SPARRSO's agent for parts procurement. Whether this will actually transpire will have to be determined but it appears to be the most viable alternative at this time.

I presented the results of my trip to DEC to SPARRSO and suggested that they strongly consider the implementation of a contract with DEC to provide parts supply, preventative maintenance training, and remedial training backup. The advantages of such a contract appear to be very beneficial to SPARRSO, especially in the early phases of their facility operation. A copy of the proposed contract, which appears in Appendix C., was presented to SPARRSO for their review.

In observing the facility in a semi-operational mode, it was possible to make a better assessment of how effective the training provided under the initial contract was absorbed. At the point in time at which I left Dhaka, I would say that at least 3 of the six engineers trained were extremely competent and were easily capable of operating the system under any but the most extreme failure conditions. Another one of the engineers may be competent but does not exhibit a great deal of confidence and tends to hold back until led. The remaining two engineers can operate the equipment but lack diagnostic skills in finding solutions to operational problems. This points up the need for training of additional maintenance personnel to support adequate operation and maintenance of the facility equipment.

As a "back-burner" task during this trip I developed a procedure for SPARRSO to produce color film products on the Optronics from black and white separates. I discovered that the Optronics film recorder had never actually been used since the installation because it has an intermittent failure mode which has existed even before delivery to Dhaka. The SPARRSO personnel were unable to correct the problem with this device. The system certainly should be made operational as soon as possible.

On 12 September a draft version of the Conclusions and Recommendations were presented to USAID and SPARRSO at meetings with A.M. Choudhury and Dr. Khan.

A
SCOPE OF WORK

I. OBJECTIVE

In conjunction with the design of possible follow-on or extension to the Agro-Climatic/Env. Monitoring Project (388-0046) the contractor will provide a qualified technician who will assess SPARRSO's present capabilities to maintain the data reception and analysis system provided under that Project and, if and where appropriate, make recommendations for modification and enhancement of its equipment maintenance capability.

II. SCOPE OF WORK

Specific tasks to be accomplished are as follows:

1. Review and become familiar with operating practices and conditions, and equipment maintenance practices and conditions at SPARRSO, especially insofar as these related to existing and expected equipment used for meteorological and (Landsat) satellite data reception and processing.
2. Assess SPARRSO's capability adequately to maintain existing and expected equipment, taking into consideration number and qualification levels of in-house maintenance personnel, maintenance service available through the private sector in Dhaka, SPARRSO's organizational structure and personnel practices, SPARRSO and BDG procurement policies and practices, and the present and anticipated level of funding for maintenance which SPARRSO will have.
3. Based upon the above, prepare a report prescribing a plan of action which will result in SPARRSO's developing and maintaining a capability to keep its equipment in good operating order. The report/plan should include the following:
 - A detailed listing of and schedule for necessary maintenance for all data reception and analysis equipment.
 - Detailed listing of and schedule for the organization and staffing of the equipment maintenance unit(s) within SPARRSO.
 - Recommendations for additional and/or enhanced training for maintenance personnel (including recommendations as to where the training could best be obtained).

- Recommendations for provisions by AID of long and/or short-term technical assistance to SPARRSO in the development of its equipment maintenance capability.
- Recommendations for utilization of in-country (non-SPARRSO) equipment maintenance services.
- Recommendations for utilization of repair and maintenance services outside of Bangladesh (i.e., from India, Singapore, U.S., etc.).
- Recommendations for development of a spare parts (and expendable supplies) procurement system - for parts and supplies needed both on routine and emergency basis. (Use of both Bangladeshi and U.S. private sector procurement services should be discussed).

III. METHOD OF APPROACH

The required scope of work will be accomplished in the following manner:

1. Conduct familiarization and information gathering visit to SPARRSO in Bangladesh, including addressing Tasks 1 and 2 of the scope of work above. Visit will include ascertaining of locations of vendor representatives and agents in locations such as Hong Kong and Singapore to be visited on the return trip to the United States. Time of performance: 2 weeks.
2. Visit U.S. manufacturers of major items of equipment to discuss sparing requirements and manufacturer's views on equipment maintenance and maintenance training. Write report covering Item 3 of Scope of Work. Time of performance: 5 weeks.
3. Visit Bangladesh to present draft of final report, review results of the scope of work, and incorporate comments into final report. Submit report and return to U.S. Time of performance: 2 weeks.

IV. REPORTS

A draft report covering all items discussed in #3 in scope of work, above will be submitted to USAID by the contractor at the end of 8 weeks. A final report, incorporating comments made by AID in response to the draft report, will be submitted to USAID and SPARRSO prior to the contractor's departure from Dhaka.



B
POTENTIAL SUPPLIERS CONTACTED

DHAKA

Beximco Computers, Ltd. - Moin Khan, Manager Systems Support, Computer Paper, Floppy Disks.

Ciproco Computers, Ltd. - M. Al-Amin, Chairman of the Board. Tandy representative - support for TRS80, possible DEC interface.

GETCO, Ltd. Local Caterpillar Tractor representative - responsible for ACEMP motor generator installation and training.

IBM - Floppy Disks, Magnetic Tapes.

Kabir Brothers, Ltd. - Jahangir Kabir, Managing Director. Trading Company - potential agent for SPARRSO, Air Conditioning contractor.

Sakaimex, Ltd. - A.A. Kamruzzaman, Managing Director, Computer Paper.

UNITED STATES

Digital Equipment Corporation, General International District, Acton, Massachusetts - William Schaffer, District Field Service Marketing Manager. Parts supplier, Preventative Maintenance Training, Remedial Maintenance Backup. Provided representative service contract.

South-East Consortium for International Development (SECID), Chapel Hill, North Carolina - Harry Wheeler, Manager Procurement Department. Procurement agent with recent experience with USAID/Nepal. Provided representative PSA contract.

Wimvex Associates, Ltd., Hopewell Junction, New York - Paul Varinga, President. U.S., PSA with experience in the Middle and Far East. Provided PSA terms for reference.

11/13/84

C
SAMPLE CONTRACTS AND PSA TERMS OF REFERENCE

DIGITAL EQUIPMENT CORPORATION
GENERAL INTERNATIONAL DISTRICT

DIGITAL EQUIPMENT CORPORATION ("Digital") agrees to provide, and . . . ("Customer") agrees to accept maintenance service on the equipment listed in Appendix A attached hereto, initialled by the parties and made part hereof, and such additional equipment as the parties may from time to time agree (collectively called the "Equipment") on the following terms and conditions:

1. DURATION

This agreement shall be effective when signed by both parties. The initial term is thirty-six (36) months from {here insert date} (Commencement Date). After the initial term has expired this agreement shall continue from year to year, and may be terminated by either party upon ninety (90) days written notice.

2. ELIGIBILITY FOR SERVICE AGREEMENT

A. The Equipment and other Digital-supplied equipment are eligible for inclusion under this Agreement immediately upon Digital installation or expiration of any on-site warranty or existing Digital On-Site Service Agreement.

B. Digital-supplied equipment not eligible for inclusion under 2.A. above will be subject to inspection by Digital to determine if it is in good operating condition. Any repairs, adjustments or field engineering changes then deemed necessary by Digital will be made at Digital's per call rates and terms then in effect prior to commencement of maintenance service.

C. Service under this Agreement is conditioned upon conformity with Digital's currently applicable minimum equipment configuration requirements.

D. The Customer's installation site ("the Site") must be in an area within a country in which the Customer or the end user has an established legal entity and where the living environment is suitable, with convenient access to the Site for Digital's Service Personnel.

3. SERVICE RESPONSIBILITIES OF DIGITAL

A. It is understood that the end-user, Bangladesh Space Agency ("Agency") has sent service personnel to the United States for training in maintenance on the Equipment, and that Agency wishes to assume responsibility for primary maintenance of the Equipment beginning one year from the Commencement Date. In order that Agency's service personnel may quickly become experienced in maintaining the Equipment, Digital's responsibilities under this Agreement shall include provision of on-the-job training to Agency's personnel for the first year of this contract. In addition, for the charges stated in Appendix A, Digital will provide preventive maintenance and will furnish On-Call remedial maintenance service. Digital may, at its option, send a VAX-qualified maintenance engineer from its General International District in Littleton, Mass., or from another Digital subsidiary or distributor field service office. In fulfillment of the above, Digital will:

- 1) Provide four scheduled preventive maintenance visits to the site during the first year of the Agreement, and while at the site, perform preventive maintenance, working with Agency's personnel and supervising such personnel to the extent deemed desirable by Digital's engineer.
- (2) Provide unscheduled, on-call remedial maintenance as required during the term of the Agreement, following notification by the Customer that the equipment is inoperative, at 75% of Digital's Per Call charges then in effect, plus air fares and per diem charges.
- (3) Provide on-the-job training on maintenance of various options at the site for the benefit of Agency's technical personnel. These seminars will be from one to two days in length, at Digital's choice.
- (4) Provide unlimited telephone/telex support from Digital's GID Technical Assistance Center (TAC), during Digital's normal working hours.
- (5) Maintain a customer configuration, application and operating system file at the TAC for use in assisting Customer.
- (6) Furnish to Customer: Tech-Tips, Safety and Field Change Order notifications, and any additional information useful in maintaining the Equipment as such information becomes available.

(7) Provide an Emergency Parts Order Service (P-1).

(8) Provide additional support services such as environmental assistance, training recommendations, site management guide, and liaison to other Digital services.

B. Digital will install, at its option, field engineering changes on the Digital-installed equipment covered by this Agreement. The installation will be at no charge if done concurrently with preventive maintenance or at another time during the Call Window as mutually agreed upon.

4. SERVICE LIMITATIONS

A. Preventive maintenance service does not include (1) operating supplies or accessories, cleaning supplies necessary for preventive maintenance, paint, or refinishing the equipment or furnishing materials for this purpose, (2) electrical work external to the Equipment, or maintenance of accessories, attachments, alterations, or any device not furnished by Digital.

B. Unless specifically listed in Appendix A, Digital does not accept any responsibility to repair non-Digital equipment, or to connect or disconnect Digital equipment to or from non-Digital equipment. However, should Digital, as a convenience to Customer, disconnect, connect or repair such equipment, it does so only on the condition that it has no liability for any damage that may result.

C. Upon the expiration of twelve (12) months after the Commencement Date, or any time thereafter, if an item(s) of Equipment cannot, in Digital's opinion, be properly or economically repaired on-site because of excessive wear or deterioration, Digital may supply the Customer with a quote for reconditioning such item(s) at Digital's Product Repair Center or other factory repair location. If the Customer does not elect to have the item(s) reconditioned, or if reconditioning is impractical due to equipment age, unavailability of replacement parts, or inability due to government restrictions to ship the material from the Site to a Digital repair facility, Digital may withdraw such item(s) from the Agreement upon ninety (90) days prior written notice.

D. Any maintenance materials, tools, documentation, Site Management Guide, diagnostic software, test equipment and spare parts necessary for the maintenance services described herein and not expressly invoiced to the Customer, will remain at all times the exclusive property of Digital, and Digital shall have access to these during normal working hours.

5. RESPONSIBILITIES OF CUSTOMER

A. Customer will notify Digital immediately of Equipment failure and will allow Digital full and free access to the Equipment. Waiver of liability or other restrictions will not be imposed as a requirement for access to the Site. Customer will allow Digital to use necessary machines, communications facilities, features and other equipment (except as normally supplied by Digital) at no charge.

B. Customer will maintain site conditions including stability of power sources within the common environmental range of all system devices and media covered hereunder, as specified by Digital prior to the Commencement Date. Customer represents that it has effective control of the site environment and has the authority and technical capability to fulfill its responsibilities with respect to site conditions.

C. A representative of Customer will be present at the Site during Digital's performance of maintenance services.

D. To facilitate Digital's performance of maintenance services, Customer will provide reasonable facilities such as, but not limited to, secure storage space, designated work area with adequate heat and light, and access to a local telephone line; these facilities are to be provided on request and at no charge to Digital.

E. Customer will purchase from Digital an initial supply of spare parts as listed by Digital in Appendix C hereto, and will maintain these spare parts in a secure storage area near the Site. Customer represents that Digital has explained to Customer Digital's normal policy of requiring a 98% Level of Service in spare parts for remote sites, and that Customer has specifically elected to purchase a lower level of service, and that Customer is willing to assume all risks with respect to downtime. Customer will purchase from Digital and import into Bangladesh all necessary tools, test equipment and documentation set forth in Appendix C and required to support the system, and shall pay all taxes, air freight, insurance and duties in connection with delivery of such items as well as spares to the site.

F. Customer will provide Digital with access to international telex and telephone facilities at the Site. Digital will reimburse customer for the corresponding standard transmittal charges.

6. PERIOD OF SERVICE AVAILABILITY

A. Customer may notify Digital via telex or telephone

that its remedial maintenance services are required. An engineer will be dispatched to the site as soon as possible. The engineer will be available at a minimum of eight hours per day, and for six days per week.

7. CHARGES

A. Charges are payable and will be invoiced as follows:

B. Charges for remedial maintenance for the first year of the contract will be invoiced upon completion of the work at \$ per day, portal to portal, plus \$ per day living expenses for each day actually spent in Bangla Desh. Charges for remedial maintenance for the second and third years of the contract will be invoiced at 75% of Digital's then applicable per call rates, plus per diem expenses and air fare.

C. Charges are payable in U.S., dollars in cash or by check drawn on a major U.S. Bank. All amounts due Digital under this Agreement are to be received by Digital in full net of any bank or government remittance, conversion, service or other fees. Customer will also pay any added value, withholding, sales, service or other taxes, official fees or charges payable in the country where services are rendered under this Agreement (except for taxes payable by Digital based on and calculated with respect to net income of Digital) in connection with this Agreement. This includes any taxes imposed in respect of the payment of any of the above taxes or other charges.

8. MOVEMENT OF EQUIPMENT

A. To permit continuity of service under this Agreement, Customer will give Digital at least sixty (60) days prior written notice of its intent to move the Equipment. Equipment moved outside the country where services are to be provided under this Agreement may be eligible for continued service under Digital's local terms and conditions then in effect for like equipment in the territory or country of re-installation.

B. Digital personnel will supervise the dismantling and packing/unpacking of the Equipment, will inspect and re-install the Equipment at the new location, and will charge the customer for all such labor and materials provided at its then current rates and terms.

C. Digital will be under no obligation to furnish continued service (preventive or remedial) under this Agreement

if the Equipment is moved from the Site and/or reinstalled without the prior written approval of Digital.

9. LIMITATION OF LIABILITY AND WARRANTY

A. Except in the case of personal injury, Digital's liability to Customer (whether in contract or tort, including negligence) for damages of any nature, will not exceed the sum of \$60,000.

B. No action (whether in contract or in tort, including negligence) arising out of the performance of services under this Agreement, may be brought by either party more than eighteen (18) months of the date of the last payment.

C. In no event will Digital be liable for any loss of data, lost profits or any special, indirect or consequential damages.

D. Except as otherwise provided by this Agreement, DIGITAL DISCLAIMS ALL WARRANTIES, INCLUDING ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

10. GENERAL

A. Digital's obligations under this agreement are conditioned upon its ability to obtain through official channels the necessary visas and permits for its personnel. Customer will assist Digital in securing such visas and permits, and DIGITAL WILL ASSUME NO OBLIGATION FOR THEIR TIMELY ISSUANCE.

B. If either party neglects or fails to perform any of its obligations under this Agreement, and such failure continues for a period of twenty (20) days after written notice thereof, the other party will have the right to terminate this Agreement forthwith.

C. The terms and conditions of this Agreement will prevail over the terms and conditions of any order submitted by the Customer for maintenance services under this Agreement.

D. This Agreement supersedes all prior service agreements and understandings between the parties with respect to the Equipment and may not be changed or terminated orally.

E. Any failure of a party to enforce strict compliance with a term or condition of this Agreement, will not constitute a waiver thereof, nor will it affect that party's right to enforce the same at any other time.

F. Neither party will assign this agreement without the prior written consent of the other party.

G. This Agreement will be governed by the laws of the Commonwealth of Massachusetts.

H. Digital reserves the right to suspend performance of its obligations under this Agreement if continued performance would, in its reasonable opinion, jeopardize the health or safety of its personnel. If an extended suspension is foreseen in such a case, Digital will refund an appropriate portion of any charges paid in advance.

IN WITNESS WHEREOF the parties have signed this Agreement on the dates indicated below.

DIGITAL EQUIPMENT
CORPORATION

By: _____

By: _____

Typed
Name: _____

Typed
Name: _____

Title: _____

Title _____

Date: _____

Date: _____

APPENDIX A
DIGITAL EQUIPMENT CORPORATION
SYSTEM CONFIGURATION

MODEL #	DESCRIPTION	QUANTITY
750XA-AJ	11/750 SYSTEM KERNEL	2
RA81-CD	RA81 DISK DRIVE AND CONTROLLER	2
RA81-AD	DISK DRIVE	2
TGU78-FD	SINGLE ACCESS TAPE SYSTEM	2
DZ11-DP	8 LINE ASYNCH MULTIPLEXER	2
LA120-DA	HARD COPY TERMINAL	2
DR11-W	DIRECT MEMORY ACCESS CONTROLLER	2
DMF32-LP	ASYNCH/ASYNCH MULTIPLEXER	2
MT220-B	VIDEO TERMINAL	2
TM78-C	TWO CHANNEL ACCESS KIT	2
DT07-88	2 PORT ISOLATED LOOP PACKAGE	1
LE80-88	PERSONAL PRINTER	1
EA11-OK	8 BIT EXPANSION BACKPLANE	8
EA11-OK	4 BIT EXPANSION BACKPLANE	8
19750-CD	19750S MEMORY	2
FR750	FLIGHTING POINT	1
DA750	MODEM OPTION	1
EA11-KV	EXPANDER BOX	1
EA11-PE	EXPANDER CABINET	3
EA11-KK	ANALOG/DIGITAL CONVERSION KIT	1
EA11-KT	ANALOG/DIGITAL CONVERTER BOYS.	1

CONTRACT FOR PROCUREMENT SERVICES AGENT

This Contract is entered into as of _____ by the University of Arkansas Acting on Behalf of the U.S. Agency for International Development and the South-East Consortium for Int'l Development having its principal place of business in Chapel Hill, North Carolina. Services to be provided under this contract shall be performed between _____ 19__ and _____ 19__.

WHEREAS, the University of Arkansas has entered into an Agreement No. 696-0110 with the United States Agency for International Development;

WHEREAS, the University of Arkansas on behalf of U.S. Agency for International Development desires to obtain the services required for the procurement and delivery of certain of the commodities to be purchased under Agreement No. 696-0110 to Kigali, Rwanda as specified; and

WHEREAS, the Agent has stated that it is fully qualified and willing to provide such services;

NOW THEREFORE, the parties to this Contract agree to the following:

Definitions:

1. "AID" means the Agency for International Development.
2. "Buyer" means the University of Arkansas Farming Systems Improvement Project.
3. "Agent" means the South-East Consortium for International Development.
4. "Supplier" means the firm or individual from which the commodity is procured by the Agent.
5. "Host Country" means the Government of the Republic of Rwanda.
6. "Handbook 11" means AID Handbook 11, Country Contracting.

ARTICLE I - SCOPE OF WORK

A. The Buyer has undertaken a project, supported jointly by the Government of the Republic of Rwanda and AID for the improvement of farming systems. The Project is identified as the Farming Systems Improvement Project (696-0110). The services of the Agent are hereby contracted for to procure for the Project commodities as described in attachment A.

The Agent is required to handle all procurement transactions as requested regardless of the size of transaction or the value of individual items.

B. Required Services:

The Agent's services will include, but not be limited to:

1. Reviewing and refining all commodity specifications, developing, modifying, or adding to specifications as necessary in order to better describe commodities in terms of technical and performance requirements, thereby assuring that each item is sufficiently identified so as not to unduly restrict competition from prospective suppliers;
2. Issuing and advertising commodity solicitations;
3. Preparing Invitations for Bids and Requests for Quotations;
4. Evaluating bids and recommending/making awards;
5. Issuing Contracts or Purchase Orders (obtaining AID and Buyer approval when required);
6. Expediting suppliers'/manufacturers' performance;
7. Inspecting and Consolidating shipments;
8. Handling and Forwarding documents;
9. Arranging freight forwarding and ocean/air transportation;
10. Providing complete and accurate monthly reports to the Buyer indicating status of each procurement actions.
11. Handling management and communication responsibilities required in implementing the procurement;
12. Handling any and all claims which might arise from subject procurement;
13. Pursuing economies in the procurement process that may be obtained through improving specifications, soliciting from sources involving the least mark-ups, obtaining project freight rates and utilizing other sound, prudent purchasing practices.

C. The Agent shall follow the procurement rules and refer to the guidelines set forth in Chapter 3 of Handbook 11. In case of a conflict between Chapter 3 and this Contract, the provisions of this Contract shall govern.

D. The official designated in the Legal Relationships clause of this Contract will send requisition documents (PIO/C, 11-94 forms, etc) to the Agent. The requisition(s) will contain data as to the quantity and descriptions of the commodities that the Buyer wants the Agent to purchase on behalf of the Buyer and will also specify other conditions such as source requirements, shipping instructions, insurance needs, and required delivery date. Upon

receipt of each requisition the Agent shall carry out the procurement of such commodities in accordance with the terms and conditions of this contract.

- E. The Agent shall seek offers/bids from a reasonable number of the most appropriate suppliers, i.e. manufacturer, distributor, wholesaler, retailer, etc., in order to obtain the lowest available competitive price. The Agent shall, where appropriate, solicit on behalf of the Buyer, discounts, rebates or other credits from the Supplier or manufacturer of a commodity, the carrier or the insurer and shall assure that all such credits are reflected in the supplier's invoice to the Buyer.
- F. All procurement transactions shall be conducted in a manner to provide, to the maximum extent practical, open competition in order to assure the most reasonable prices. Although the Agent may seek information from suppliers in carrying out its contractual responsibilities, the Agent shall assure that no supplier receives an undue advantage.
- G. Solicitations for commodities and related services shall be based upon a clear and accurate description of the technical requirements for the material, product or services to be procured.
- H. Solicitations shall clearly set forth all requirements which bidders/offerors must fulfill and all factors to be used in evaluating bids or proposals.
- I.
 1. The Agent is expected to communicate expeditiously with the Buyer concerning procurements under this Contract.
 2. The Agent shall submit to the Buyer a status report each month that indicates, at a minimum, what commodities have been ordered, expected shipping dates, and actual shipping dates and names of vessels as available.
- J. The Agent shall maintain procurement records and files for all purchases, which shall include the following:
 1. Evidence of solicitation of offers;
 2. Basis for supplier selection;
 3. Justification for lack of competition when competitive bids or offers are not obtained and a copy of waiver from AID; and
 4. Price or cost analysis (reference to price comparisons and reasonableness of cost elements).
- K. The Agent shall maintain a system of contract administration to ensure supplier conformance with terms, conditions and specifications of the contract or purchase order to assure adequate and prompt deliveries.

- L. In all contracts and purchase orders with suppliers, the Agent shall include the clauses required by Section 2.13 of Handbook 11, Chapter 3. In addition to those clauses and other provisions necessary to define a sound and complete agreement, the Agent shall include the following provisions:
1. A provision specifying that the commodities (including raw material, components, intermediate assemblies and end products) shall be subject to inspection and test by or on behalf of the Buyer and at the expense of the Buyer prior to shipment.
 2. When appropriate for the type of commodity being purchased, a clause requiring the supplier to provide a warranty which shall, at a minimum, protect the Buyer from any loss due to defective workmanship, material and parts for twelve months after initial delivery to the port of entry, provided that removal from the port of entry will take place not later than two months after discharge from the vessel. The Buyer shall give the supplier prompt notice of any claims under such warranty and, if the supplier fails to remedy defects within a reasonable time, shall have the right to take such remedial action as may be necessary and to claim the reasonable cost thereof from the supplier.
- M. Should any insurance claim arise as a result of the shipment of commodities purchased pursuant to this contract the Buyer shall forward to the Agent with the claim a copy of the Bill of Lading, the original insurance certificate and surveyor's report detailing the damage. The Agent shall take such steps as may be necessary to collect the claim. All claims honored by the insurance company shall be payable to the Buyer and proceeds realized shall be utilized for repair or replacement of the lost, destroyed or damaged commodities in accordance with AID requirements. The Agent shall submit to the Buyer a statement of claims honored by the insurance company and received by the Agent.

ARTICLE II - PAYMENTS

A. Payment for Agent's Services

1. Amount

The Buyer will pay the Agent the total fixed amount of \$ (). This amount is the entire payment called for in the Scope of Work and no additional payments will be made to the Agent for purchasing or arranging for commodity-related services as may be required.

2. Schedule and Documentation

The Agent will be paid on a monthly basis. Requests for payment will be supported by the following documentation:

1. Voucher SF 1034 in original and three copies.
2. One copy of the Agent's invoice.
3. One copy of each relevant bill of lading or airway bill for the commodities shipped.

The Agent shall submit the request for payment and the appropriate documentation to the Buyer. The Buyer shall provide a "Certification of Performance" or "Certification of Nonperformance of Specific Items" within 30 days after receipt of the request. If neither certification is provided within 30 days, the Agent shall be paid according to the request.

B. Payment for Commodities and Commodity-Related Services

1. Amount

The Buyer will reimburse the Agent for commodities and commodity related services purchased in accordance with this contract at the price agreed to in the purchase order or contract between the Agent and supplier of the commodity or related service.

2. Schedule

- a. Suppliers of commodities and freight will be paid on the basis of shipment of the commodities; except that when the Agent consolidates commodities for shipment, the commodity supplier may be paid on the basis of delivery into custody of the Agent. Suppliers of other commodity-related services will be paid on the basis of delivery of services.

3. Documentation

- a. Requests for payment for commodities and freight will be supported by the appropriate documentation required under Chapter 3 of Handbook 11.
- b. Requests for payment of other commodity-related services which are not covered by the commodity supplier's request for payment will be supported by the following:
 - (i) One copy of the invoice for the services
 - (ii) One copy of the following as appropriate:
 - (a) the inspection certificate; or
 - (b) the marine insurance policy
 - (c) the warehouse receipt.

ARTICLE III - SPECIAL PROVISIONS

A. Legal Relationships

1. Relationship of Parties

- a. The Agent shall perform the services under this contract for the benefit of the Buyer
- b. The official of the Buyer who has authority to issue purchase requests, PIO/C's, change orders, etc. is _____
(Name and Title)

2. Legal Effect of AID Approvals and Decisions

- a. The parties hereto understand that the Contract has reserved to AID certain rights such as, but not limited to, the right to approve the terms of this Contract, the supplier, and any or all plans, reports, specifications, subcontracts/purchase orders, bid documents, drawings, or other documents related to this Contract and the project of which it is a part. The parties hereto further understand and agree that AID, in reserving any or all of the foregoing approval rights, has acted solely as a financing entity to assure the proper use of United States Government funds, and that any decision by AID to exercise or refrain from exercising these approval rights shall be made as a financing entity in the course of financing this project and shall not be construed as making AID a party to the contract. The parties hereto understand and agree that AID may, from time to time, exercise the foregoing approval rights, or discuss the matters related to these rights and the foregoing approval rights, or discuss the matters related to these rights and the project of which this Contract is a part, with the parties jointly or separately, without thereby incurring any responsibility or liability to the parties jointly or to any of them.
- b. Any approval (or failure to disapprove) by AID shall not bar the Buyer or AID from asserting any right, or relieve the Agent of any liability which the Agency may otherwise have to the Buyer or AID.

B. Source and Nationality

1. Commodities

Each purchase request or PIO/C issued to the Agent shall specify the eligible source countries either by name or by AID Geographic Code. If not specified, the eligible source is the U.S. only. Commodities must meet the course, origin, and componentry requirements in Handbook 11, Chapter 3, Section 2.6.1 and 2.6.2. Suppliers of commodities must meet the nationality requirements in Handbook 11, Chapter 3, Section 2.6.3.

2. Delivery Services

Each purchase request or PIO/C issued to the Agent shall specify the eligible source for delivery services either by name or by AID Geographic Code. If not specified, the eligible source is the U.S. only. Delivery services must meet the eligibility requirements in Handbook 11, Chapter 3, Section 2.6.4 and, in addition, ocean transportation must meet the cargo preference requirements in Section 2.7 of the same chapter. When Code 941 is the authorized source for delivery services, the cooperating country is

also eligible to provide delivery services. Under AID grants, the eligible source for international air transportation is always the United States.

C. Documents furnished by the Buyer

The Buyer shall furnish to the Agent lists and description of the commodities to be purchased, and other related documents which pertain to the technical requirements for the AID-financed project of which the Contract is a part.

ARTICLE IV - GENERAL PROVISIONS

A. Marking

All commodities and their shipping containers, except materials shipped in bulk and semi-finished products which are not packed in any way, shall be marked with the official AID (clasped hands) emblem in accordance with AID marking requirements. The Agent is responsible for making sure that the Supplier is informed of the AID marking requirements and that the supplier correctly marks commodities and shipping containers as per Handbook 11, Chapter 3, Section 2.12.5.

B. Inspection

The Agent agrees to permit authorized representatives of the Buyer and AID, at all reasonable times, to inspect its facilities, activities, and work pertinent to the contract in the USA or abroad, and to interview personnel engaged in the performance of the contract to the extent deemed necessary by the Buyer and AID.

C. Taxes

All commodities and services shall be exempt from all taxes, fees, levies, customs or impositions imposed under laws in effect in the host country or the Buyer shall make payment for or reimbursement for such taxes, fees, levies, customs or impositions to the extent specified in the Agreement signed between the government of the host country and AID.

D. Nondiscrimination

During the performance of this contract, the Agent agrees not to discriminate in the recruitment or employment conditions of personnel hired in the United States because of race, color, religion, sex, or national origin.

E. Conflict of Interest

No employees, officers or representatives of the Agent shall participate in the selection, award or administration of a contract where, to their knowledge, they or any immediate family member or partner have a financial or future employment interest. The Agent's officers, employees, and representatives shall neither solicit nor accept gratuities, favors or

anything of monetary value from suppliers or potential suppliers, carriers or insurers, nor shall they engage in any activity which is or gives the appearance of being a conflict of interest.

F. Books and Records

The Agent shall maintain books, records, documents and accounts with respect to all transactions under or connected with this contract adequate to show whether all requirements of this contract have been complied with. The system of accounts employed by the Agent shall follow generally accepted accounting principles. All such books, records, documents and accounts shall be subject to inspection and audit by the Buyer or any of its duly authorized representatives, at all reasonable time, and the Agent shall afford such official personnel proper facilities at the place where such books and records are normally maintained for such inspection and audit. The Agent agrees to maintain such books and records, to make them available for inspection for a period of three years after final payment under this contract. However, records which relate to appeals under the "Disputes" clause of this contract, or litigation or the settlement of claims arising out of the out of the performance of this contract shall be retained until such appeals, litigation or claims have been finally settled.

G. Assignments

The Agent may not assign the right to receive payments nor delegate any of its duties under this contract without the prior written approval of the Buyer.

H. Changes, Amendments, and Modifications

1. The Buyer may at any time, by written order, make changes within the scope of work of this contract. Changes in the number, type, specifications, etc. of the commodities to be procured shall be governed by the provisions of Article II - Payments. If any change not covered by Article II causes an increase or decrease in the cost of, or the time required for, performance of any part of the work under the contract, an equitable adjustment shall be settled in accordance with the provisions of the "Disputes" clause of this contract.

2. No amendments of modifications of this contract may be made except in writing signed by the authorized representative of the Buyer and the Agent.

I. Suspension of Work

1. The Buyer may, in writing, order the Agent to stop all or any part of the work under this contract for a period of up to 90 days from the specified a effective date. Upon receipt of such an order, the Agent shall comply with its terms and take all reasonable steps to minimize the incurrence of costs allocable to the work covered by the order.

2. Within the period of the Suspension of Work Order, the Buyer, may either cancel the Suspension Work Order or terminate the work covered by such Order as provided in the "Termination by the Buyer for Convenience" clause of this contract.
3. If the Suspension of Work Order is cancelled or the Order expires, the Agent shall resume work. An equitable adjustment shall be made as necessary in the time schedule, the price, or a combination thereof, or any other provisions of the contract that may be affected, and the contract shall be amended accordingly, if the Agent asserts a claim for such adjustment within 30 days after the end of the period of work suspension. Failure to agree to any adjustment shall be a dispute under the "Disputes" clause of this contract.

J. Termination by the Buyer for Convenience

1. This contract may be terminated by the Buyer in whole, or from time to time in part, in accordance with this clause whenever the Buyer shall determine that such termination is in the best interest of the Buyer.
2. Termination shall be affected by Notice of Termination to the Agent, specifying that termination is for the convenience of the Buyer, the extent to which performance of work under the contract the contract is terminated, and the date upon which such termination becomes effective.
3. After receipt of a Notice of Termination and except as otherwise directed by the Buyer, the Agent shall:
 1. Stop work under the contract on the date and to the extent specified in the Notice of Termination, and place no further orders or subcontracts except as may be necessary for completion of the portion of the work under the contract which is not terminated;
 2. Terminate all orders and subcontracts to the extent that they relate to the performance of work terminated by the Notice of Termination;
 3. Assign to the Buyer as it may direct, all of the right, title, and interest of the Agent under the orders and subcontracts so terminated, in which case the Buyer, shall have the right to settle or pay any claims arising out of the termination of such orders and subcontracts;
 4. With the approval or ratification of the Buyer, to the extent the Buyer may require, which approval or ratification shall be final and conclusive for all purposes of this clause, settle all outstanding liabilities and all claims arising out such termination of orders and subcontracts;
 5. Complete performance of the part of the work which has not been terminated by the Notice of Termination; and

6. Take such action as may be necessary for the protection of the property related to this contract which is in the possession of the agent and to which the Buyer has title.
4. The Agent shall submit to the Buyer its written claim promptly but not later than three months from the effective date of termination, except as the Buyer may agree in writing.
5. The Agent and the Buyer shall consult within 30 days of the submission of the claim concerning the sole or any part of the amount to be paid to the Agent by reason of the termination of work. The contract shall be amended accordingly, and the Agent shall be paid the agreed amount.
6. In deciding the amount due the Agent, all settled claims which the Buyer, may have against the Agent in connection with this contract; and the agreed price for, or the proceeds of sale of property acquired by the Agent or sold and not otherwise recovered by or credited to the Buyer, shall be deducted.
7. Any disagreement regarding termination amounts or procedures shall be settled under the clause of this contract entitled "Disputes".

K. Termination by the Buyer for Default

1. The Buyer, subject to the provisions of this contract, by written notice of default to the Agent sent by registered mail, may terminate the whole or any part of this contract in any one of the following circumstances:
 - (a) If the Agent fails to perform the work called for by this contract within the period specified, or
 - (b) If the Agent fails to perform any of the order provisions of this contract, or so fails to prosecute the work as to endanger performance of this contract in accordance with its terms, and in either of these two circumstances, does not cure such failure within a period of ten (10) days (or such other period as the Buyer may authorize in writing) after receipt of notice from the Buyer specifying such failure.
2. In the event the Buyer terminates this contract in whole or in part as provided in paragraph 1 of this clause, the Buyer may procure upon such terms and in such manner as the buyer may deem appropriate, work similar to the work so terminated and the Agent shall be liable to the Buyer for any excess costs for similar work. However, the Agency shall continue performance to the extent not terminated under the provisions of this clause.

L. Force Majeure

1. Except with respect to default of subcontractors or suppliers, the Agent shall not be liable for any excess costs if the failure to perform the contract arises out of causes beyond the control and without the fault or negligence of the Agent (Force Majeure) and if the Agent, within 15 days from the beginning of any such Force Majeure notifies

the Buyer of such prevention of performance and the cause thereof. Such causes may include, but are not restricted to, acts of the Borrower/Grantee in either its sovereign or contractual capacity, war, revolution, riot, earthquake, fires, floods, epidemics, quarantine restrictions, strikes, freight, embargoes, and unusually severe weather, but in every case the failure to perform must be beyond the control and without the fault or negligence of the Agent. If the failure to perform is caused by the fault of a subcontractor or Supplier and if such default arises out of causes beyond the control of the Agent and the subcontractor or supplier and without the fault or negligence of them (Force Majeure) and the Agent, within 15 days from the beginning of any such Force Majeure notifies the Buyer of such prevention of performance and the cause thereof, the Agent shall not be liable for any excess costs due to the failure to perform, unless the supplies or services to be furnished by the subcontractor or supplier were obtainable from other sources in sufficient time to permit the Agent to meet the required delivery schedule.

2. In the event of a Force Majeure, the Agent, unless otherwise directed by the Buyer in writing, shall continue to undertake and perform the duties set forth in this contract as far as is reasonably practical.
3. In the event of a Force Majeure resulting in a suspension of work, this contract shall be extended by a period equal to that for which the Agent was prevented from performing.
4. The Agent shall be entitled to reasonable costs incurred as a consequence of a Force Majeure.
5. If the Agent's inability to perform by reason of the Force Majeure lasts for more than 45 days after notice has been given to the Buyer, either party may terminate this contract and the Agent shall be entitled to any sums which would be payable in case of termination of this contract by the Contracting Agency for convenience.

M. Report of Delays

The Agent agrees to keep the Buyer fully informed about any delays in the procurement of shipment of commodities under this contract and the corrective action being taken.

N. Disputes

1. In the event of a disagreement under this contract, the Agent shall submit a written statement to the Buyer briefly describing the nature of the problem, the position of the Agent regarding the issue and a narrative of facts in support of the Agent's position.
2. Within 10 days after receipt of the Agent's statement, the Buyer shall decide the issue and deliver a written statement of the decision to the Agent, including the reasons supporting the decision, if adverse to the Agent.

3. Within 30 days after receipt of the Buyer's decision or the date such decision was due, the Agent may submit to the Buyer a written Notice of Appeal including a detailed description of the facts of the dispute with the dates of events, names of persons involved, references to documentation bearing on the matter (with copies attached), the relevant contract provision(s), the Agent's contentions and conclusions, and a statement of why the Buyer's decision is being questioned.
4. If within 30 days after delivery of a Notice of Appeal, the parties cannot agree to a satisfactory settlement, the matter shall be presented for arbitration following the rules of the International Chamber of Commerce.

O. Worker's Compensation Insurance

1. The Agent, before commencing performance under this contract shall maintain coverage through worker's compensation insurance of security covering each employee to the extent required by the Defense Base Act of the United States, if applicable, but in any event equivalent to coverage required by law or custom in the location where the employee is performing services.
2. The Agent agrees to insert this clause in all subcontracts hereunder except those exclusively for furnishing commodities.

P. Governing Law and Language

1. This contract shall be interpreted in accordance with the laws of the United States of America.
2. The English language version of this contract shall govern.

Q. Notices

1. All notices or other communications between the contracting parties shall be in English and shall be directed to the following addresses:

(Agent)

(Address)

(Buyer)

(Address)

WORK-DESCRIPTION OF A PROCUREMENT SERVICE AGENT (FSA)

- 1.a. The Agent is responsible for preparing and/or refining non-restrictive specifications for equipment listed in paragraph C. herebelow based on detailed requirements and/or catalogue descriptions furnished by the Principal.
- b. Specifications for vehicles and communication equipment will be provided by the Principal; the Agent is responsible for reviewing these vehicle specifications to assure their adequacy.
- c. Specification prepared/refined on items having a unit FOB value of \$25,000.- or more shall be sent to the Principal for review and approval before purchase action is initiated.
2. The Agent is responsible for purchasing all items requested by the Principal in accordance with AID's Handbook 11 CH-3 to include advertising, document preparation, solicitation, evaluating bids, recommending /granting awards, issuing purchase orders, and for obtaining all necessary approvals.
3. The Agent is responsible for following-up on orders placed, to expedite supplier's performance, and if the supplier can not deliver, to take necessary actions to re-procure.
4. The Agent is responsible to consolidate shipment to the extent possible, packing for export when necessary, and arranging freight when required.
5. The Agent is responsible for arranging independent inspection of commodities as requested by the Principal; also for having visual inspection arranged on material being consolidated for shipment to assure that all items are accounted for and that there are no obvious discrepancies between commodities contracted and shipped.
6. The Agent is responsible for obtaining marine insurance in the name of the Principal and for Principal's account on all cargoes on a warehouse-to-warehouse basis at 120% of the CIF value and for handling any insurance claims arising thereunder.
7. Any re-ordering necessary, other than when the original supplier cannot deliver (see par 3. above), shall be considered to be additional Line-Item(s) and shall be handled in accordance with the provisions in the clause "Change Orders" in the Contract.
8. The Agent is responsible for arranging the issuance of letters of credit to suppliers of commodities and commodity related services under the terms of the Bank Letter(s) of Commitment that shall be issued by AID to finance the procurement.
9. In all the work undertaken by the Agent, the Agent shall follow appropriate AID's Regulations as specified, including the policies on restricted and prohibited commodities and the eligibility criteria and special provisions for certain commodities set forth in the AID's Commodity Eligibility Listing (AID's HB-15 Appendix B.) as from time to time amended.

D
DATA ACQUISITION AND ANALYSIS CENTER (DAAC)
PROVISIONAL ORGANIZATION

I. HEAD OF CENTER

A. RESPONSIBILITIES

- Administrate DAAC facility.
- Direct Operations, Maintenance, Software, and Facility Utilization groups.
- Prepare budget and initiate requests for equipment procurement.
- Write proposals and solicit potential facility users.

B. REQUIRED CAPABILITIES

- Have overall view of SPARRSO's objectives to be able to determine long-term priorities for facility use.
- Sufficient engineering background to understand facility's capabilities and limitations.
- Able to interact well with SPARRSO personnel and outside contacts to promote use of facility.
- Able to project future needs and make budget recommendations for necessary expansion.

II. OPERATIONS GROUP

A. RESPONSIBILITIES

- Provide day-to-day operation of the facility.
- Set up system authorization and accounting files and procedures to allocate system resources.
- Monitor system activities and adjust system parameters if necessary for optimum facility utilization.
- Interact with Maintenance Group in detection and correction of equipment failures.

- Establish and maintain a handbook of Standard Operating Procedures (SOP) for system operation.
- Establish a policy and schedule for regularly backing-up files on public disk file volumes.
- Maintain an information retrieval data base for magnetic tape library.

B. REQUIRED CAPABILITIES

- Sufficient understanding of the overall system operation, hardware and software, to provide day-to-day operational support to the facility.
- Sufficient vendor training and/or equivalent experience to be able to adjust system parameters for optimum efficiency.
- Sufficient vendor training and/or equivalent experience to establish and maintain a user accounting system.

III. MAINTENANCE GROUP

A. RESPONSIBILITIES

- Responsible for reliable operations of the facility hardware, including environmental control.
- Responsible for both preventative and corrective maintenance procedures.
- Establish and maintain a handbook of Standard Operating Procedures (SOP) for hardware maintenance.
- Interact with the Operations Group to detect impending equipment failures based on system error messages and scheduled preventative maintenance.
- Maintain spares and consumables inventory for facility operation.
- Maintain an information retrieval data base for the spares and consumables.

B. REQUIRED CAPABILITIES

- Be able to analyze logical, electrical, and mechanical operations using diagrams and functional schematics.

- Be able to perform preventative maintenance and, where applicable, run diagnostic programs for fault isolation.
- Be able to make necessary adjustments to equipment.
- Be able to interpret system error messages and diagnostic printouts.

IV. SOFTWARE GROUP

A. RESPONSIBILITIES

- Maintain system software and software libraries.
- Implement and/or direct applications software modifications and upgrades.
- Develop software documentation and standardization procedures.
- Support implementation and maintenance of an information management system.
- Develop and maintain a user's manual for the operational software in the facility.

B. REQUIRED CAPABILITIES

- Vendor level training in system software operation.
- Vendor level training or equivalent experience in assembly level and higher programming languages.
- Familiarity with the theory and operation of data base management systems (DBMS).

V. FACILITY UTILIZATION GROUP

A. RESPONSIBILITIES

- Interact with individual users to determine facility resource requirements.
- Determine and provide user support and training for effective facility utilization.

- Interact with the Operations and Software Group to provide necessary support to users.

B. REQUIRED CAPABILITIES

- Sufficient understanding of overall system operation, hardware and software, to adequately advise potential users on the feasibility of proposed projects.
- Able to interact well with SPARRSO personnel in providing system support and promoting facility useage.
- Able to assist potential users in problem definition to the point of determining if software development is required and, if so, to act as the interface between the Software Group and the user.

APPLICATIONS

TECHNOLOGY

RESEARCH

Applications

Facilities

Research

DATA ACQUISITION AND ANALYSIS CENTER

(DAAC)

OPERATIONS

- APT
- HRPT
- GMS
- DCS
- Computer
- Optronics, Matrix Wing/Lynch
- Digitizer Table
- Magnetic Tape Library

MAINTENANCE

- AFT
- HRPT
- GMS
- DCS
- Computer
- Optronics, Matrix
- I²S Display
- Spares Inventory

SOFTWARE

- System software and software libraries
- Implementation and maintenance of DBMS
- Software documentation and standardization procedures
- Users' manual
- Software development and/or direction

FACILITY UTILIZATION

- User interface to facility
- Provide support and training to potential users
- Operate on users' behalf with Operations and Software Groups to provide facility resources